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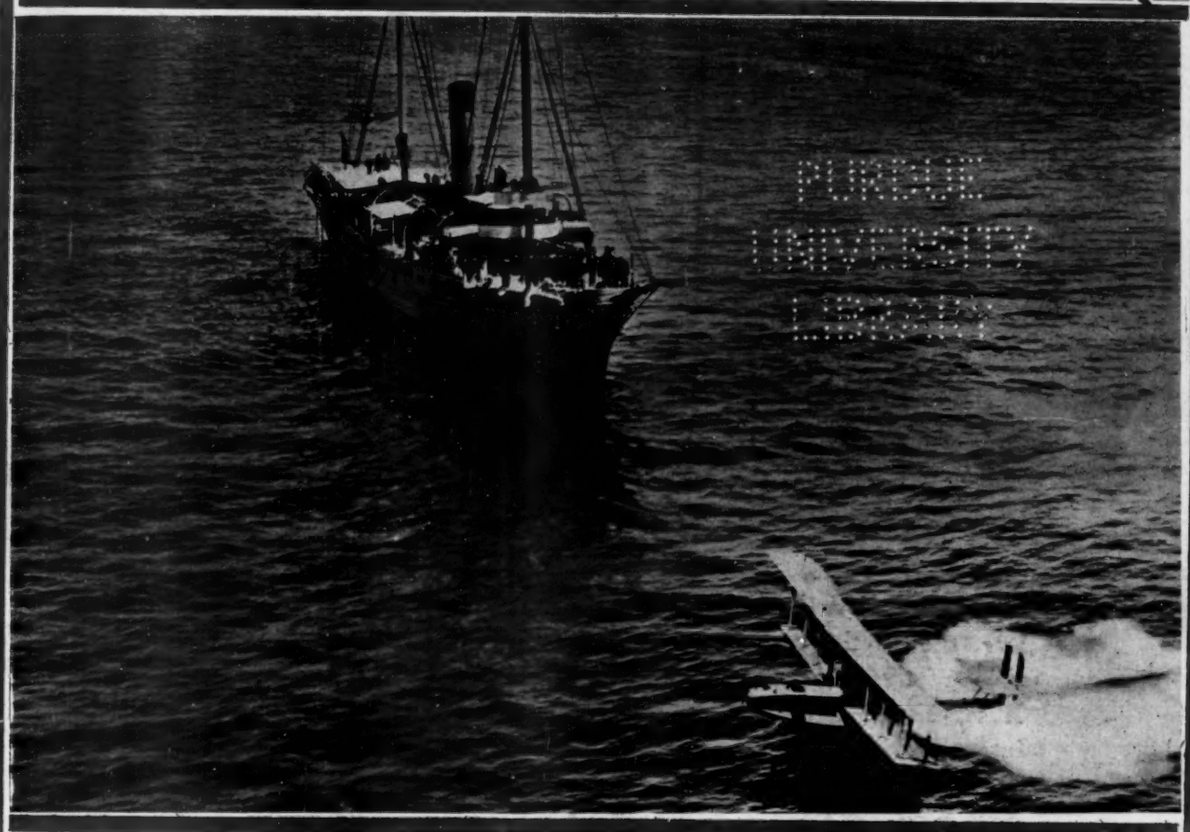

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VOLUME XV

NUMBER 1

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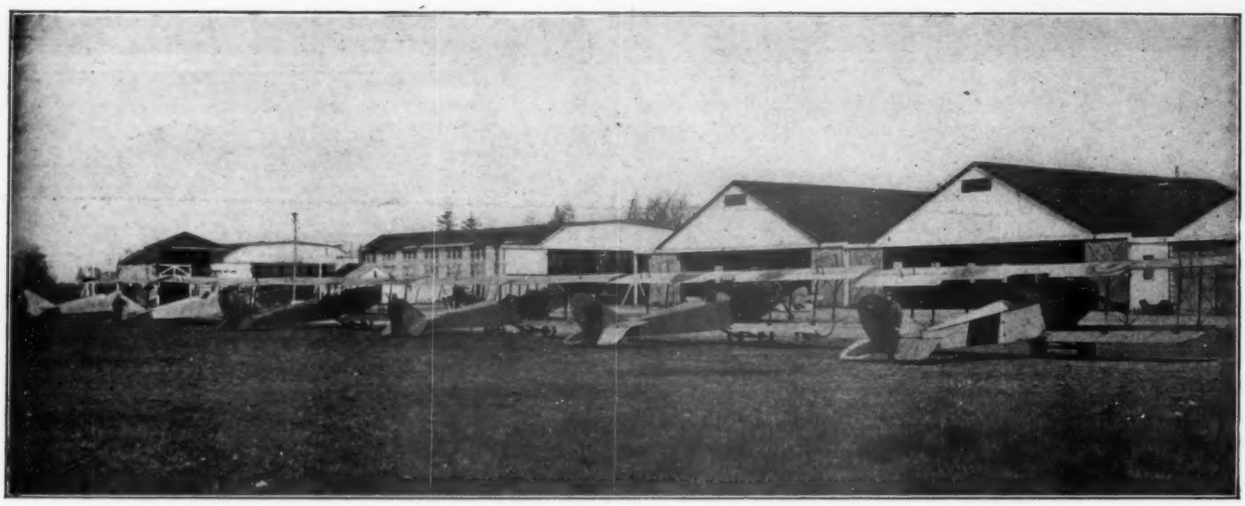

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JULY 2, 1923

AVIATION

VOL. XV. NO. 1

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CONTENTS

Editorial	5	National Balloon Race Entries	17
Aircraft Development since the Armistice	6	Amundsen Abandons Polar Flight	17
Rules Governing St. Louis Air Races	10	New British Aircraft Carrier	17
An Aeronautical Survey of South America	14	Helicopter Hovers 9 Minutes	17
British Assistance for Racing Aircraft	16	Airports and Airways	18
Aircraft in Warfare	16	Army and Navy Air Forces	21

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Power Gliding

THE great enthusiasm shown over the recent light plane accomplishments has caused airplane designers to wonder if there really is a demand for a light plane. If the demand were authentic and sustained it would be supplied. The performance of the French machine is not so unusual as the press which was promoting it would have us believe, but one of its limitations is now evident.

From an interview with Barbot after the crash of the Dewoitine in the treetops of New Jersey, the newspaper which heralded the approach of the air flivver as the great event of the day, draws the conclusion that the lesson to be learned is that more power is necessary. A disparaging comparison is made between the 400 hp. DH and the 15 hp. Dewoitine. In other words the light plane is pictured as a complete failure. This is a mistaken assumption, for the temporary failure of the Dewoitine was not due to the limited power. Increasing the size of the engine would destroy all value of the experiment. We must look elsewhere for the cause of the trouble.

One of the objections to the light plane is the fact that it floats a long ways on landing, requiring a very large field. Of course it does. That is what the light plane class is built for, to float, or rather to maintain flight at low speeds. The pilot who is used to heavy machines and mile square airdromes, dives into his field and levels out near the ground with some 90 to 100 m.p.h. speed. If the field is enclosed with trees and protected from the wind this is also very nearly his ground speed. Now, owing to another light plane advantage, the resistance is low and therefore the deceleration is low and the plane must necessarily "float clear across the field" before its speed is reduced to the 20 to 25 m.p.h. at which landing is possible. The fault lies not with the machine nor with its size, lightness or power limitation, but with the inexperience of pilots on the new types. Pilots do not know yet how to use the advantage of low landing speed. In this connection E. T. Allen, well known for his experiments with the M.I.T. glider, writes: "The trouble with us all at Clermont-Ferrand last year was we were not content with glider flying speed; we wanted to have a good strong resistance on the control such as we were used to on heavy fast machines."

The second difficulty is reliability. The reason the Liberty motor DH's on the mail service operate safely is because the motors are reliable and are given constant expert attention. It is not a question of additional power but of a good motor well cared for. The reliability should be far easier to obtain in a small motor than a large one. This will have to be done before the public will have anything to do with the light plane. As for safety of large planes most pilots would rather have ten forced landings in a plane landing at twenty to thirty miles per hour than one in a DH4 Liberty.

The change in interest from gliders to light power has lead us away from a profitable field of study much too soon. It is fortunate that our Soaring Meet in California is to concentrate our efforts upon the more scientific and more fundamental problems for a time. After the English contest last October we had only begun to realize how little we knew about glider design. And now, already we are complicating the problem by trying to produce a motor glider, the hybrid which neither soars nor gives us speed. When we are ready for the light plane it will come and it will have less power rather than more than the French product which demonstrated economical flight in America.

Cost of Airplane Travel

THE remarkable cheapness of travel on German airlines is shown in the following quotation from a letter recently received by George Newbold, the business manager of AVIATION, from his son, George Newbold, Jr., who is a cadet on the New York nautical training ship "Newport."

"Two of the other fellows and myself flew from Bremen to Berlin and back in a Fokker cabin monoplane for $2.50 U. S. currency, a total distance of about 400 miles. We were in the air altogether close to 5 hr. The plane only made about 80 m.p.h."

The above statement is the kind that creates a very unfortunate impression in the United States. Comparisons are made with the cost of travel by airplane here. It is also noted that only a few transportation routes are operating in this country. The inevitable question is—Why?

Subsidy, Subsidy, Subsidy—the word cannot be too often repeated. But it is so easily overlooked or forgotten by those who make comparisons between European and American air lines. England, France and Italy are making a supreme effort to provide an adequate air arm. Germany, debarred from the manufacture of military types of aircraft, is keeping aviation alive by supporting commercial air lines. Through this subsidy the German air lines are able to make passenger rates astonishingly low.

Of course, other factors also enter into a comparison of costs of airplane travel here and in Germany. The purchasing value as against the exchange rate of German currency, the cheapness of materials and the cost of labor are such factors. By rail, the four hundred mile trip would cost in this country about twelve dollars.

Reports like the above lead uninformed persons to conclude that American aviation is behind Europe. This is not the case, except in respect to government encouragement, military, naval and commercial. If returning travellers would tell their representatives in Congress about the progress abroad and how the government is backing aeronautical progress, much good would result.

Aircraft Development since the Armistice*

Prepared by Engineering Division, U. S. Army Air Service
McCook Field, Dayton, Ohio

In order to review recent developments of the service airplane in as brief a manner as possible, a preliminary outline of airplane status, 1918, airplane status 1922, is tabulated below. In the former outline it will be noted that the five branches of army aviation form the main purpose divisions. In the latter outline, fifteen distinct service types are designated as fulfilling the requirements of army aviation.

ALLIED AIRPLANES, 1918	
Branch.	Examples.
Pursuit aviation.	
Day pursuit	SE5 Scout and Spad.
Ground attack ..	Sopwith Salamander.
Two-seater fighter	Bristol Fighter.
Attack aviation.	
Ground attack ..	Armored Junker
Observation aviation.	
Night observation	British FE8
Corps observation	DH4 and Breguet.
Bombardment aviation.	
Day bomber	DH4 and Salmson.
Night bomber ..	Handley Page and Caproni.
Training aviation.	
Preliminary	JN4D and Std. J1.

ARMY AIRPLANES, 1922	
Branch.	Model.
Pursuit aviation.	
Type I water-cooled, day	PW
Type II, night pursuit	PN
Type III, air-cooled, day	PA
Type IV, ground attack	PG
Type V, two-seater, day	TP
Attack aviation.	
Type VI, ground attack	GA
Type VII, infantry liaison	IL
Observation aviation.	
Type VIII, night observation.	NO
Type IX, Army observation	AO
Type X, Corps observation.	CO
Bombardment aviation.	
Type XI, day bomber	DB
Type XII, night short-distance.	NBS
Type XIII, night long-distance.	NBL
Training aviation.	
Type XIV, air-cooled engine.	TA
Type XV, water-cooled engine.	TW

Pursuit Development

Pursuit development has undergone marked improvement since the armistice. Five definite service types have been initiated to cover all phases of pursuit aviation. All pursuit improvement will be taken up by type.

Type I airplanes involve single-seaters with water-cooled engines. This type, assigned to day pursuit, represents a marked improvement over the day pursuit of 1918. In the place of the latter's high speed of 120 m.p.h. the Type I airplane is required to have a high speed of 145 m.p.h. at 15,000 ft. altitude. Further improvement is noted in a climb to 20,000 ft. in 21 min., a service ceiling of 23,750 ft., an endurance of 2.5 hr. at 15,000 ft. altitude plus ½ hr. at ground level, and a useful load of 525 lb. Fixed armament consists of one .30-caliber and one .50-caliber machine gun. The type designating letters for all experimental or contract articles of this type are "PW."

Type I service equipment is represented by Thomas-Morse MB3's and Boeing MB3A's. Both items of the foregoing equipment proceeded the installation of type-designating letters. A few of the other equipment examples to be cited have done likewise. The Thomas-Morse MB3's and MB3A's are externally braced biplanes mounting the 300 hp. model H, Wright engine. The former was designed and built under contract with the Thomas-Morse Aircraft Corp., while the latter, involving slight design modifications of the original MB3, were built under contract with the Boeing Airplane Co. These airplanes, which are now well known to the service, represent very conventional structural design. Equipment awaiting service test is represented by the Engineering Division PW1, the Loening PW2A, and the Loening PW2B. The PW1 is an externally braced biplane, mounting the 350 hp. 1237 Packard 12-cylinder engine. This airplane, designed by the Engineering Division, has a welded steel-tube fuselage, steel tail surfaces, and wood wings of tapered RAF-15 sections. A tunnel-type radiator is located immediately beneath the power plant. A construction contract involving this airplane has recently been terminated by the Air Service. The PW2A and PW2B are rigidly braced monoplanes, mounting, respectively, the 300 hp. model H Wright engine and the 350 hp. 1237 Packard 12-cylinder engine. These airplanes, designed by the Loening Aeronautical Engineering Corp., represent conventional structural design and are undergoing flight test. Equipment not ready for service test is represented by the Orenco PW3 and the Gallaudet PW4. The PW3 is an externally braced biplane, mounting the 300 hp. model H Wright engine. This airplane, designed by the Ordnance Engineering Corp., is of conventional design and has passed the static test requirements of the Engineering Division. The PW4 is an internally braced biplane, mounting the 350 hp. 1237 Packard 12-cylinder engine. This airplane, designed by the Gallaudet Aircraft Corp., is of all-metal construction. The more important structural members of the PW4 are of steel, while the main mass of the remaining structure is of duralumin. Obsolescent equipment is represented by the Orenco D2's. The Orenco D2's were externally braced biplanes mounting the 200 hp. model H Wright engine. This airplane, designed by the Ordnance Engineering Corp., was of conventional structural design.

Type I equipment at large is under special development in that a supercharged 300 hp. model H Wright engine has been installed in an Orenco D2. Data as to the service value of such an installation is awaiting further flight tests. New tail surfaces are under design and construction for the MB3's. Further modifications will include the installation of Lamblin radiators.

Type II airplanes involve single-seaters with either air-cooled or water-cooled engines. This type, assigned to night pursuit, has no 1918 equivalent. Day pursuits were specially equipped to fly as night pursuits during 1918. Improved type requirements include: High speed, 127 m.p.h. at 10,000 ft. altitude; climb, 15,000 ft. in 20 min.; service ceiling, 21,000 ft.; an endurance of 2.5 hr. at 15,000 ft. altitude plus ½ hr. at ground level; and a useful load of 554 lb. Fixed armament consists of two .30-caliber machine guns. The type designating letters are "PN."

Type II service equipment and equipment awaiting service test are nil. A contract for equipment not ready for test, was canceled, involving the Curtiss PN1. The PN1 was an internally braced biplane, mounting the 220 hp. Liberty 6-cylinder engine. This airplane, designed by the Curtiss Aeronautical & Motor Corp., had a steel tube fuselage, but was otherwise of very conventional design.

Type II equipment at large is not under special development during the present fiscal year.

Type III airplanes involve single-seaters with either fixed radial or rotary air-cooled engines. This type, assigned to day pursuit, represents a marked improvement over the air-cooled day pursuit of 1918. Such improved type requirements have been made at high speed—135 m.p.h. at 15,000 ft. altitude; climb from 15,000 to 24,000 ft. in 30 min.; service ceiling 25,000 ft.; an endurance of 2.5 hr. at 15,000 ft. altitude plus ½ hr. at ground level; and a useful load of 532 lb. Fixed armament consists of one .30-caliber and one .50-caliber machine gun. The type designating letters are "PA."

Type III service equipment and equipment awaiting service test are nil. Equipment not ready for service test is represented by the Loening PA1. The PA1 is an externally braced biplane, mounting the 350 hp. Wright radial engine. This airplane, designed by the Loening Aeronautical Engineering Corp., has a bolted steel tube fuselage and rectangular wood wings of thick wing section. The first article has successfully met static test requirements and a second article is awaiting the arrival of a power plant incident to full flight test. Obsolescent equipment is represented by the Nieuport-27's and Nieuport-28's. The Nieuport-27's are externally braced "plane and one-half" biplanes, mounting the 110 hp. Le Rhône rotary air-cooled engine. The Nieuport-28's are externally braced biplanes, mounting the 165 hp. single-valved Gnome rotary air-cooled engine. These airplanes, capable of better than 130 m.p.h. at ground level represented one of the swiftest of

the 1918 allied pursuits. The airplanes are of French design and construction.

Type III equipment at large is not undergoing special development during the present fiscal year.

Type IV airplanes involve armored single-seaters with either air-cooled or water-cooled engines. This type, assigned to pursuit ground attack, represents a marked improvement over its 1918 predecessor. High speed of 125 m.p.h. and an endurance of 1.5 hr. at ground level are required. The offensive armament consists of one .50-caliber or one 11 mm. machine gun and one 37 mm. cannon. The type designating letters are "PG."

Type IV service equipment and equipment awaiting service test are nil. Equipment not ready for service test is represented by the Engineering Division PG1 and by the Fokker V40, the latter not conforming to Airplane Specification No. 521B. The PG1 is an externally braced "plane and one-half" biplane mounting the 300 hp. model K Wright cannon engine. This airplane was designed by the Engineering Division and constructed under contract with the Boeing Airplane Co. The crew, power plant, and fuel tanks are completely armored. Every effort has been made to provide against the emergency of portions of the wing structure, flying wires, controls, etc., being shot away. The Fokker V40 is an internally braced monoplane mounting the 400 hp. Liberty 12-cylinder engine. This airplane, designed and constructed by Anthony H. G. Fokker, has a welded steel tube fuselage, veneer-covered cantilever wings of all-wood construction, and removable armor plate protecting the pilot, power plant, and fuel tanks. There is no present obsolescent equipment for this type.

Type IV equipment at large is not undergoing special development during the present fiscal year.

Type V airplanes involve two-seaters with either air-cooled or water-cooled engines. This type, assigned to day pursuit, represents marked improvement over the preceding 1918 type. With unsupercharged engine, type requirements include: High speed 130 m.p.h. at 15,000 ft. altitude; climb 20,000 ft. in 30 min.; service ceiling, 22,000 ft.; endurance, 2.5 hr. at 15,000 ft. altitude plus ½ hr. at ground level; and a useful load of 944 lb. With a supercharged engine, the following excellent performances have been estimated: High speed, 145 m.p.h. at altitudes between 17,000 and 31,000 ft.; climb, 20,000, 25,000, and 30,000 ft. in 21, 28, and 37 min., respectively; service ceiling, 34,000 ft.; and an endurance of 2 hr. at 20,000 ft. altitude plus ½ hr. ground level. Type V is equipped to take a 300 lb. bomb load. Further armament consists of one .30-caliber and one .50-caliber fixed machine gun, two .30-caliber flexible machine guns, and one .30-caliber flexible floor machine gun. The type designating letters are "TP."

Type V service equipment and equipment awaiting service tests are nil. Equipment not ready for service test is represented by Engineering Division TP1. The TP1 is an externally braced biplane, mounting a super-charged 400 hp. Liberty 12-cylinder engine. This airplane, at present in process of design and construction within the Engineering Division, has welded steel fuselage, fixed side radiators, and biplane wings, the upper plane of which has been reduced in chord. This airplane will represent the first service supercharged Type V airplanes of American design. There is no obsolescent equipment for this type.

Type V equipment at large has been continuously under special development within the Engineering Division. The same Le Père biplane with which Major Schroeder attained a world's altitude record Feb. 20, 1920, has been further improved. This airplane was originally designed and constructed under the supervision of Captain Le Père of the French Aviation Mission. Further 1921 supercharger improvements made it possible for Lieut. John A. Macready to again break all previous records, and attain an elevation from sea level of 37,670 ft., upon Sept. 28, 1921.

Attack Development

Attack development, involving multiseaters, has undergone considerable improvement and enlargement since the armistice. There now exist two definite service types of airplanes which cover all phases of attack aviation.

Type VI airplanes involve three-seaters having engines, crew, and fuel tanks completely armored. This type, assigned to hostile ground attack, represents a considerable improvement over the multiseater ground attacks of 1918. High speed of 120 m.p.h. is required, while endurance calls for 1.5 hr. at ground level. One of the major items of improvement consists of one 37 mm. cannon; one flexible, four special fixed, and one special flexible floor .30-caliber machine guns; a large supply of machine-gun ammunition; and a 300 lb. bomb load. The type designating letters are "GA."

Type VI service equipment is represented by the Engineering Division GA1's. The GA1's are externally braced triplanes, mounting two 400 hp. Liberty 12-cylinder engines. These airplanes were designed by the Engineering Division and constructed under contract with the Boeing Airplane Co. The crew, power plant, and fuel tanks are completely armored. Every effort has been made to provide against portions of the airplane being shot away in combat. Equipment not ready for service test is represented by the Boeing GA2. The GA2 is an externally braced biplane, mounting the 700 hp. model W 12-cylinder engine. This airplane, designed and constructed under contract with the Boeing Airplane Co., is the first service type of airplane to mount the new "W" engine. As in the case of all attack airplanes, provision against hostile combat fire directed at unarmored portions of the airplane have been specially provided for. Equipment awaiting service test and obsolescent equipment are nil.

Type VI equipment at large is not undergoing special development within the present fiscal year.

Type VII airplanes involve two-seaters having engines, crew, and fuel tanks completely armored. This type, assigned to infantry liaison, represents a post-armistice development entirely. This type is designed for intimate communication with combat troops. As in the case of ground attack, ceiling and climb are not important. High speed of only 110 m.p.h. at ground level is required, while endurance is three hours at the same level. A useful load of 949 lb. is specified, which includes an armament composed of one .50-caliber fixed machine gun, two .30-caliber flexible machine guns, one special flexible floor machine gun, and a bomb load of 300 lb. The type designating letters are "IL."

Type VII service equipment is nil. Equipment awaiting service test is represented by the Orenco IL1. The IL1 is an externally braced biplane, mounting the 400-hp Liberty 12-cylinder engine. This airplane, built under contract with the Ordnance Engineering Corp., has the crew, power plant, and fuel tanks completely armored. The usual provisions against hostile combat fire directed at unarmored portions of the airplane have been specially provided for. Structurally the airplane is of conventional design. Equipment not ready for service test and obsolescent equipment are nil.

Type VII equipment at large is not undergoing special development within the present fiscal year.

Observation Development

Observation development, involving multiseaters, has undergone improvement and enlargement since the armistice. In the place of the original night observation and corps observation types, three service types of airplanes are now utilized to cover an enlarged field of observation.

Type VIII airplanes, involve two-seaters with either air-cooled or water-cooled engines. The type, assigned to night observation, represents an improved medium for observing all those principal means of hostile communication which permit of troop movement, supply movement, and the like. Type specifications designate: High speed, 110 m.p.h. at 15,000 ft. altitude; climb, 15,000 ft. in 25 min.; service ceiling, 20,000 ft.; endurance, 4 hr. at 10,000 ft. altitude plus ½ hr. at ground level; and a useful load of 924 lb. The latter includes an armament comprised of one .30-caliber fixed machine gun, two .30-caliber flexible machine guns, one special flexible floor machine gun, and a bomb load of 200 pounds. The type designating letters are "AO."

Type VIII service equipment is represented by substitute Type X service equipment, to which suitable night-flying equipment has been added. Such substitution is applicable to the remaining three equipments.

Type VIII equipment at large is not undergoing special development within the present fiscal year.

Type IX airplanes involve three-seaters with either air-cooled or water-cooled engines. The type, assigned to Army

and Coast Artillery observation and surveillance, represents in the main a post-armistice development. Specifications for speed, climb, and service ceiling closely adhere to those of Type VIII. Endurance, however, is 5 hr. at 15,000 ft. altitude plus ½ hr. at ground level. A useful load of 1,384 lb. includes armament composed of two sets of two flexible .30-caliber machine guns, one special flexible floor machine gun, and a bomb load of 300 lb. The type designating letters are "AO."

Type IX equipment, equipment awaiting service test, equipment not ready for service test and obsolescent equipment are nil.

Type IX equipment at large is not under special development within the present fiscal year.

Type X airplanes involve two-seaters with either air-cooled or water-cooled engines. This type, assigned to corps observation, represents a marked improvement over its 1918 predecessor. A great deal of attention has been directed toward the development of this particular type of airplane. High speed is specified at 120 m.p.h., endurance is 4 hr. at 10,000 ft. altitude plus ½ hr. at ground level, while a useful load of 971 lb. may be carried. Same includes an armament consisting of one .30-caliber fixed machine gun, two .30-caliber flexible machine guns, one special flexible floor machine gun, and a 200 lb. bomb load. The type designating letters are "CO."

Type X service equipment is represented by DH4B's. The DH4B's are externally braced biplanes, mounting the 400 hp. Liberty 12-cylinder engine. These airplanes, built under contract with the Dayton-Wright Co., are of conventional design and are well known to the service. A modification, called the DH4B1's, provides for a fuel capacity of 110 gal. Equipment awaiting service test is represented by the Engineering Division models CO1 and CO2. The CO1 is an internally braced monoplane, mounting a supercharged 400 hp. Liberty 12-cylinder engine. This airplane, designed and constructed within the Engineering Division, is of all-metal construction. The construction is chiefly duralumin, with steel for the more important structural members. Same is now in process of full-flight test. The CO1 represents the first all-metal construction attempted by the Engineering Division. The CO2 is an externally braced biplane, mounting the 400 hp. Liberty 12 cylinder engine. This airplane, under design and construction within the Engineering Division, has a bolted steel tube fuselage, metal tail surfaces, and conventional wings. Certain deviations from standard airplane type specification No. 1527-B have been permitted. Obsolescent equipment is represented by the Engineering Division XB1A's and the DH4BW's. The XB1A's are externally braced biplanes, mounting the 300 hp. model H Wright engine. This airplane, designed and constructed by the Engineering Division, has a monocoque veneer fuselage, but is otherwise of conventional structural design. The DH4BW's are externally braced biplanes, mounting the 300 hp. model H Wright engine. In other essentials the airplane represents the characteristics of the standard DH4B.

Type X equipment at large has undergone special development in that a pressure gasoline system has been designed for the standard DH4B service airplane. Pressure is derived from a sylphon-type pump directly driven by the main airplane power plant. The installation of a 300 hp. model H Wright engine in the same airplane has already been referred to.

Bombardment Development

Bombardment development, involving multiseaters, has undergone unusual progress and enlargement since 1918. In the place of the original day bombardment and night bombardment types, three service types of airplanes are utilized to cover bombardment aviation. Before entering into a discussion of the three phases of bombardment aviation brief mention will be made of recent bombardment activity. It is not necessary to give in detail the bombardment last summer of certain designated naval equipment. Successively a submarine, a cruiser, a destroyer, and a battleship were submitted to air attack. Bombs varying from naval 37 pounders to Army 2,000 lb. projectiles were utilized with effects that stunned the naval powers of the entire world. It is estimated that it will take ten years of naval activity to develop adequate armor for defensive against 2,000 lb. bombs. More recent air tests have been made of 4000 lb. bombs at the Aberdeen Proving Grounds. It is hard to conceive of naval armament which would withstand successfully the terrible crushing force of such projectiles. Constant improvements to bomb sights are also making possible the accurate release of bombs from considerable altitudes.

Type XI airplanes involve two seaters with either air-cooled or water-cooled engines. The type, assigned to day bombardment, is designed to carry its useful load at as high an altitude as possible. Attack is made upon any hostile objective within operations radius. To attain same, specifications require that an altitude of 15,000 ft. be reached within the period of 30 min., with an accompanying ceiling, 17,500 ft. altitude; endurance, 5 hr. at 10,000 ft. plus ½ hr. at ground; and a useful load of 1550 lb. The last named includes an armament of one .30-caliber machine gun, two flexible, .30-caliber machine guns, one special flexible floor machine gun, and a 500 lb. bomb load. The type designating letters are "DB."

Type XI service equipment is represented by USD9A's. The USD9A's are externally braced biplanes mounting the 400 hp. Liberty 12 cylinder engine. This airplane, designed by the Engineering Division, was a close revision of the British DH9A. There is nothing out of the ordinary in its structural features. Equipment not ready for service test is represented by the Gallaudet DB1. The DB1 is an internally braced monoplane, mounting the 700 hp. model W 12 cylinder engine. This airplane, designed and constructed under contract with the Gallaudet Aircraft Corp., is of all-metal construction. The more important structural members are of steel, while the major portion of the remaining structure is of duralumin. This model represents the largest all-metal airplane which the Air Service has attempted to fabricate.

Type XI equipment at large is not undergoing special development within the present fiscal year.

Type XII airplanes involve multiseaters with either air-cooled or water-cooled engines. The type, assigned to the night bombardment of short-distance objectives, is designed to carry a somewhat greater useful load at slightly less altitude than the day bomber. This loss of altitude is permitted by the added protection of night flying. In type specification the following major requirements are laid down: Endurance, 5 hr. at 10,000 ft. altitude plus ½ hr. at ground level, and a useful load of 2,817 lb. This load includes an armament of two sets of two flexible .30-caliber machine guns, one special floor machine gun, and a bomb load of 1,500 lb. The type designating letters are "NBS."

Type XII service equipment is represented by the Martin MB2's and the NBS1's, which are modified Martin MB2 models at present under contract construction at the Curtiss Aeronautical & Motor Corp. and L.W.F. Engineering Co. The NBS1's are externally braced biplanes, mounting two 400 hp. Liberty 12 cylinder engines. This airplane is under triple construction contract as follows: A contract with the Glenn L. Martin Co. for articles to be known as Martin MB2's and contracts with the Curtiss Aeronautical & Motor Corp. and the L.W.F. Engineering Co. for articles to be known as NBS1's. Except for size, engine nacelles, integral with lower wing, and double rudder and fin, the NBS1 represents conventional biplane design.

Type XII equipment at large has undergone considerable development within the present fiscal year. A revised Martin MB2 has been installed with three rudders. Flight tests indicate same as of considerable promise. A second MB2 has been extensively modified within the Engineering Division. The standard power plants were replaced by two 300 hp. model H Wright engines. The main portion of the fuselage forward of the wings was entirely redesigned to mount the 400 hp. Liberty 12 cylinder engine. Fuel tanks were increased in capacity, the pilot was removed well to the fuselage rear, and the immediate rear of the fuselage entirely redesigned for the accommodation of special camera equipment. The revised airplane is assigned to photographic reconnaissance.

Type XIII airplanes involve multiseaters with either air-cooled or water-cooled engines. The type, assigned to long-distance night bombardment, is designed to carry maximum useful loads to maximum distances. Airplanes of this type

are capable of great destruction to hostile nerve centers. The following type specifications are of interest: High speed, 95 m.p.h.; climb, 10,000 ft. in 35 min.; endurance, 6 hr. at ground level; and the unusual useful load of 7,500 lb. This load includes an armament of two sets of two flexible .30-caliber machine guns, one special floor machine gun, and a bomb load of 5000 lb. Type XIII, with the designating letters "NBL," concludes the types of airplanes comprising bombardment aviation.

Type XIII service equipment and equipment awaiting service test are nil. Equipment not ready for service test is represented by the Barling NBL1. The NBL1 is an externally braced triplane, mounting six 400 hp. Liberty 12 cylinder engines. This airplane, designed by Mr. Barling and under construction contract with the Witteman Aircraft Corp., represents the largest airplane under the supervision of the Army Air Service. Its huge size, monocoque fuselage and four engine nacelles mark it as an airplane of unusual structural arrangements. The first article is still in process of construction.

Type XIII equipment at large is not undergoing special development within the present fiscal year.

Training Development

Training development, involving two-seaters, had undergone improvement and enlargement since the armistice. Present training airplanes are designed to be readily controlled, to be high in strength factors, to protect as far as possible the operating crew in case of a crash, and to be moderate in performance.

Type XIV airplanes involve two-seaters equipped with either fixed radial or rotary air-cooled engines. The type is assigned to the preliminary training of Army airplane pilots. Type XIV airplanes are equipped with crash-proof fuel tanks to lessen fire hazard in the event of accident. Type specifications of particular interest are: High speed, 125 m.p.h.; climb, 10,000 ft. in 15 min.; service ceiling, 16,000 ft. altitude; endurance, 2.5 hr. at ground level; and useful load, 140 lb. in excess of the weight of the crew.

Type XIV service equipment is nil. Equipment awaiting service test is represented by the Dayton-Wright TA3. The TA3 is an externally braced biplane, mounting the 80 hp. Le Rhône rotary air-cooled engine. This airplane, designed and built under contract with the Dayton-Wright Co., has a welded steel tube fuselage, conventional wings, and side-by-side seating arrangement for instructor and student. One article of this airplane has been static tested and a second revised article is awaiting full flight test. Type XIV equipment not ready for service test is represented by the G. Elias TA1,the Huff Daland TA2, and the Engineering Division TA4. The TA1 is an externally braced biplane mounting the 140 hp. Lawrance radial air-cooled engine. This airplane, built under contract with the G. Elias Co., is awaiting the arrival of its power plant. The TA2 is an externally braced biplane. One article of the TA2 contract was delivered with a 90 hp. model OX5 Curtiss engine, while a second was delivered with a 140 hp. Lawrance radial air-cooled engine. The contract of the TA2 was placed with Huff-Daland & Co., and originally called for a radial engine. The TA4 is an internally braced monoplane at present under design within the Engineering Division. It is planned to construct the fuselage of duralumin tubing. Type XIV obsolescent equipment is represented by the Thomas-Morse S4C. This airplane, mounting the 80 hp. Le Rhône rotary air-cooled engine, is a biplane of conventional structural design. The S4C concludes service airplanes at present common to Type XIV.

Type XIV equipment at large is not undergoing special development during the present fiscal year other than the installation of a water-cooled engine in one article of the TA2 contract, as has heretofore been noted.

Type XV airplanes involve two-seaters equipped with water-cooled engines. The type is assigned to the preliminary training of Army airplane pilots. Detailed specifications covering (1) performance, (2) useful load, (3) strength factors, and (7) equipment are identical for both Type XIV and XV. There are no specifications covering (4) bombs, (5) guns, and (6) pyrotechnics. Only equipment destined for machine gunnery schools carry special armament.

Type XV service equipment is represented by the Curtiss JN4H. This airplane is an externally braced biplane mounting the 150 hp. model I Wright engine. Equipment awaiting service tests is nil. Equipment not ready for service test is represented by the converted TA2, heretofore mentioned, and the Cox-Klemin TA2. The TW2 is an externally braced biplane mounting the 180 hp. model E Wright engine. This airplane was built under contract with the Cox-Klemin Aircraft Corp. One article of the contract only has been received. Obsolescent equipment is represented by the Curtiss JN4D's. These airplanes were externally braced biplanes, and mounted the 90 hp. Curtiss model OX5 engine. As has been mentioned before, the JN4D's were extensively used for early training purposes.

Type XV equipment at large is undergoing special development during the present fiscal year in several instances. A special air-pressure fuel system is under development for the JN4H airplane. Pressure is furnished by means of a wind-driven pump. An Engineering Division DN4H has been specia'ly equipped as a night-flying airplane. This airplane is utilized as a means of testing night-flying equipment being developed at his field. A second Engineering Division JN4H has been specially equipped with the Art Smith dual control. By means of this control an instructor can independently correct students errors or cause a student flying along in a normal manner to correct simulated errors. A service test of this airplane was carried on at Carlstrom Field, Arcadia, Fla., Mr. Smith himself acting as instructor. A report is pending concerning the results.

Type XV equipment at large under special development concludes the discussion covering aircraft development since the armistice in so far as the fifteen types constituting service Army airplanes are concerned. A few special-purpose airplanes are also fostered by the Army Air Service.

Special Types under Development

The Engineering Division has drawn up two special airplane type specifications covering respectively a single-seater pursuit, special type, known to the service as an Alert airplane and a single-seater messenger airplane, known as the Engineering Division Messenger airplane. The former bears the type designating letters "PS," the only miscellaneous model designation so far given any Army airplane.

The Alert airplane has been developed for the purpose of defending service airdromes from hostile air attack. This airplane, which is not intended for operation over hostile territory, features as its greatest essential maximum climb in minimum time.

Alert airplanes comprise single-seaters with either air-cooled or water-cooled engines. In performance the very rapid climb of 20,000 ft. in 18 min. is required, together with high operating speed and handiness of control. Endurance is specified as 1.5 hr. at ground level. In useful load, a total of only 354 lb. are specified. This includes an armament of one fixed .50-caliber machine gun. Strength factors are those of Type I. Bombs are omitted.

Dayton-Wright PS1.—The PS1 is a rigidly braced monoplane, mounting the 9 cylinder fixed radial 200 hp. model J1 Lawrance engine. This airplane, being built under contract with the Dayton-Wright Co., has a welded steel tube fuselage, retractible chassis, shock-obsorbing wheels, partially metal tail surfaces, and tapered wings. The first article of the contract is to have 11 lb. per square foot conventional wood wings; the second, similarly loaded "flap type" wings (high lift); and the third, 13 lb. per square foot flap type wings. Comparative tests are desired with all three wing combinations.

Messenger airplanes comprise single-seaters with air-cooled engines. No definite performance specifications have been yet laid down for this type. The official performance test of airplane A.S. 111088 may be indicative. High speed, 90 m.p.h. at ground level; climb, 6500 ft. in 28 min.; service ceiling, 6750 ft. altitude; and endurance, 6 hr. at ground level were attained. Useful load carried was 222 lb. Certain fuel system revisions are at present underway which will reduce endurance and improve performance.

Engineering Division Messenger airplane.—The Messenger is an externally braced biplane, mounting a radial 60 hp. Lawrance 3 cylinder air-cooled engine. This airplane was designed by the Engineering Division. Structurally, the Messenger is of conventional biplane design.

Rules Governing the St. Louis Air Races

Jointly Issued by St. Louis Air Board and Flying Club of St. Louis Under N.A.A. Sanction

(Concluded from last issue)

Flying Club of St. Louis Trophy

Monday, Oct. 1, 1923

This Trophy, donated by the Flying Club of St. Louis, shall be competed for by airplanes of 90 hp. or less, and shall become the permanent possession of the entrant of the winning airplane.

CONDITIONS OF CONTEST:

(a) In order to stimulate interest among civilian pilots, Army and Navy pilots will not compete in this race.

(b) Engine must be 90 hp. or less. (Horsepower as given by the Engineering Divisions of the U. S. Air Service at McCook Field will be taken as standard.)

(c) All airplanes must carry a total load of 340 lb., evenly distributed in two cockpits, this load to consist of pilot and one passenger, with sufficient ballast, if necessary, to bring their weight up to the required amount. It is requested by the Contest Committee that all contestants carry ballast in lieu of passenger, in order to eliminate hazard in this respect. Under no consideration may open cockpits be covered.

(d) General condition and design of plane to be such that in the opinion of the Contest Committee it is safe and not a menace to other contestants or spectators. The Contest Committee reserves the right to refuse to admit any airplane which does not comply with these requirements.

(e) At the time of entry the entrant must supply the Contest Committee with a statement, giving the bore and stroke of the engine to be used in the race, this statement to be properly executed before a notary public. The Contest Committee reserves the right to check the measurements of any engine entered and to demand the removal of a cylinder for this purpose. The decision of the Contest Committee will be final.

DISTANCE:

150 kilometers (93.21 miles), three times around a closed course of 50 kilometers (31.07 miles), starting at St. Louis Field, thence north to the first turning pylon, thence southwest to the second turning pylon, and return to St. Louis Field.

THE WINNER:

Of first place shall be the pilot who has completed the full course in the shortest elapsed time, and of second place the second best time, etc., provided the pilot is not disqualified. The Flying Club of St. Louis Trophy will be awarded to the entrant of the winning airplane and the prize money will be paid to the entrants of the winning airplanes.

NUMBER OF CONTESTANTS:

Minimum number: Four.

Maximum number: Sixty.

CASH PRIZES:

First prize $500, second prize $300, third prize $200.

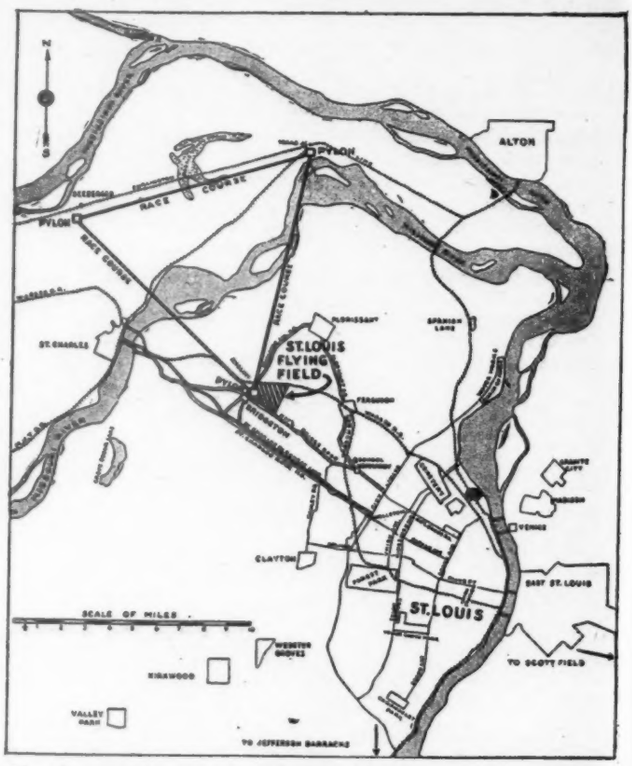
Liberty Engine Builders' Trophy

Monday, Oct. 1, 1923

The trophy shall be perpetual and competed for annually by observation type (two-place) airplanes or flying boats.

The annual contest shall be in the nature of a race either around a closed circuit or from point to point and shall be conducted under such rules governing such race as may be prepared from time to time by the Contest Committee of the National Aeronautic Association. The Contest Committee, with the consent of the Board of Governors of the donee, shall have the privilege of conducting each such annual contest for the Liberty Engine Builders' Trophy, or of assigning this privilege, under sanction, to any other Club or organization.

The trophy shall be awarded each year to the Aero Club or chapter of the N.A.A. represented by the pilot of the winning machine, and this body shall be entitled to the possession of the trophy until one month prior to the next succeeding contest, at which time the trophy shall be returned to the donee. Suitable bonds for its proper care and return shall be required by the donee from each and every person or organization into whose possession the trophy shall at any time be delivered. Should the trophy be won by contestants from a foreign country, then it shall be awarded for the same period of time to the embassy in this country representing the foreign nation from which the winning contestants shall enter, or to the United States Air Service, according to the decision of the Contest Committee of the donee.



Sketch map showing location of Bridgeton Field, St. Louis, and 50 kilometer course for National Air Races, Oct. 1 - 3, 1923

Gold, silver and bronze decorations will be given to the pilots winning first, second and third places.

CONDITIONS OF CONTEST:

(a) Factor of safety: 6 as loaded for start of race.

(b) Air speed greater than 90 m.p.h.

(c) Carrying the following "contest load" and, in addition, crew 340 lb. "Contest loads" shall be determined from the following formula using as a basis the cubic inch displacement for the 400 hp. Liberty engine.

$$\frac{400}{1649.34} \times \text{cubic inch displacement of motor used} \times .85$$

= Contest Load.

Note: Fire extinguishers and parachutes may be included in the "contest load"; however, fixed instruments, gas, oil and water for the course are excluded. Bomb racks, guns and mounts may be removed. At the time of entry the entrant must supply the Contest Commitee with a statement giving the bore and stroke of the engine to be used in the race, this statement to be properly executed before a notary public.

The Contest Committee reserves the right to check the measurements of any engine entered and to demand the removal of a cylinder for this purpose. In case there is a question of the cubic inch displacement of the engine, the Contest Committee reserves the right to use the cylinder displacement figures given for such engine by the Engineering Division, McCook Field. The decision of the Contest Committee will be final.

DISTANCE:

300 kilometers (186.42 miles)—six times around a closed course of 50 kilometers (31.07 miles), starting at St. Louis Field and north to first pylon, then southwest to second pylon, then east, passing over captive ballon located approximately 5 miles east at about 1500 ft. altitude, and continuing to St. Louis Field.

THE WINNER:

Of the first place shall be the pilot who has completed the full course in the shortest elapsed time, and of each second place the second best time, etc., provided the pilot is not disqualified. The Liberty Engine Builders' Trophy will be awarded to entrant of winning airplane and the prize money paid to the entrants of the winning airplanes.

NUMBER OF CONTESTANTS:

Minimum number: Four.

Maximum number: Forty.

CASH PRIZES:

First prize $800, second prize $500, third prize $200.

Aviation Country Club of Detroit Trophy

Tuesday, Oct. 2, 1923

The Trophy shall be perpetual, and competed for annually by airplanes of the light commercial class.

The annual contest shall be in the nature of a race either around a closed circuit or from point to point, and shall be conducted under such rules governing such race as may be prepared from time to time by the Contest Committee of the National Aeronautic Association. The Contest Committee, with the consent of the Board of Governors of the donee, shall have the privilege of conducting such annual contest for the Aviation Country Club of Detroit Trophy, or of assigning this privilege, under sanction, to any other club or organization.

The Trophy shall be awarded each year to the Aero Club or Chapter of the National Aeronautic Association represented by the pilot of the winning machine, and this body shall be entitled to the possession of the Trophy until one month prior to the next succeeding contest, at which time the Trophy will be returned to the donee. Suitable bonds for its proper care and return shall be required by the donee from each and every person or organization into whose possession the Trophy shall at any time be delivered. Should the Trophy be won by contestants from a foreign country, then it shall be awarded for the same period of time to the embassy in this country representing the foreign nation from which the winning contestants shall enter, or to the United States Air Service, according to the decision of the Contest Committee of the donee.

Gold, silver and bronze decorations will be given to the pilot winning first, second and third places.

TROPHY AWARD:

The Aviation Country Club of Detroit Trophy will be awarded to the entrant of the airplane receiving the highest total awards for speed and efficiency. In case of a tie, the Trophy will be awarded for first position in the efficiency portion of the race, providing the pilot is not disqualified.

CONDITIONS OF CONTEST:

(a) In order to stimulate interest among civilian pilots, Army and Navy pilots will not compete in this race.

(b) Average air speed greater than 80 m.p.h. in race.

(c) Factor of safety of wing cellule as loaded for start of race: 4 low incidence condition; 6 high incidence condition.

(d) Engine or engines must total 200 hp. or less, with a total piston displacement not to exceed 750 cu. in. Horsepower will be taken from the normal horsepower rating as given in the official McCook Field report for the engines used.

(e) All airplanes must be constructed to seat comfortably a pilot and at least two passengers. It is requested by the Contest Committee that all contestants carry ballast in lieu of passengers in order to eliminate hazard in this respect. Under no consideration may obviously open cockpits be covered during the race. This does not eliminate "cabin" type fuselages which allow the passengers to be comfortably seated in the cabin during the flight.

(f) The general condition and design of plane to be such that in the opinion of the Contest Committee it is safe and not a menace to other contestants or spectators. The Contest Committee reserves the right to refuse to admit any airplane which does not comply with these requirements.

DISTANCE:

250 kilometers (155.34 miles)—five times around a closed course of 50 kilometers (31.07 miles), starting at St. Louis Field and thence north to first pylon, thence southwest to second pylon, thence east passing over captive balloon located approximately 5 miles east at about 1500 ft. altitude continuing east to St. Louis Field.

(A) WINNER (Light Commercial Speed):

Of first place shall be the pilot who has completed the full course in the shortest elapsed time, and of second place the second best time, etc., provided the pilot is not disqualified and the prize money will be paid to the entrants of the winning airplanes.

(B) WINNER (Light Commercial Efficiency):

Of first place shall be the pilot who has completed the full course with the highest figure of merit based on formula, and of second place the second highest, etc., provided the pilot is not disqualified, and the prize money will be paid to the entrants of the winning airplanes. The winner of this race shall be the pilot of the airplane who receives the highest figure of merit based on the following formula:

$$\frac{W}{H.P.} \times M.P.H. = \text{Figure of merit,}$$

where W = weight of load passengers, and $H.P.$ = horsepower credited contestant, and $M.P.H.$ = average speed of completing race in miles per hours (must not be less than 80). The horsepower credited to the contestant will be determined as indicated in Par. d, under "Conditions of Contest." The contest load shall consist of passengers, or 170 lb. ballast in lieu of each passenger.

At the time of entry the entrant must supply the Contest Committee with a statement giving the bore and stroke of the engine to be used in the race, this statement to be properly executed before a notary public. The Contest Committee reserves the right to check the measurements of any engine entered and to demand the removal of a cylinder for this purpose. In case there is a question of the cubic inch displacement of the engine, the Contest Committee reserves the right to use the cylinder displacement figures given for such engine by the Engineering Division, McCook Field. The decision of the Contest Committee will be final.

WEIGHING THE LOAD:

All ballast must be installed in the plane before 9 a. m., Tuesday, Oct. 2. This load must be checked and sealed in place by the Contest Committee and names of pilots and passengers (if any) put on record. It shall be entirely the responsibility of the contestant to see that the load in his plane is properly weighed and sealed by the Contest Committee.

Seals and loads will be checked by a member of the Contest Committee after the plane has landed on completion of the race.

NUMBER OF CONTESTANTS:

Minimum number: Six.

Maximum number: Forty.

CASH PRIZES:

Speed—First prize $500, second prize $300, third prize $200.

Efficiency—First prize $500, second prize $300, third prize $200.

Merchants Exchange of St. Louis Trophy

Tuesday, Oct. 2, 1923

This trophy, donated by the Merchants Exchange of St. Louis, shall be competed for by large capacity airplanes capable of carrying a pay load of 2000 lb. or over, and shall become the permanent possession of the entrant of the winning airplane.

CONDITIONS OF CONTEST:

(a) Factor of safety of wing cellule as loaded for start of race: 3 low incidence condition; 4 high incidence condition.

(b) Air speed greater than 85 m.p.h.

(c) Capable of carrying a pay load of 2,000 lb. or over, at a minimum climb of 150 ft. the first minute. (The Contest Committee may require the contestant to demonstrate by actual flight that his plane can meet these conditions.)

(d) All airplanes will carry the following "contest load" and in addition crew 340 lb., also gas, oil and water sufficient for the race. The contest load shall be determined from the following formula, using as a basis the cubic inch displacement for the 400 hp. Liberty engine.

$$\frac{400}{1649.34} \times \text{cubic inch displacement of engine or engines used} \times 2. = \text{"contest load."}$$

Note: Fire extinguishers and parachutes may be included in the "contest load," however, fixed instruments are excluded. Bomb racks, guns and mounts may be removed.

(e) At the time of entry the entrant must supply the Contest Committee with a statement giving the bore and stroke of the engine to be used in the race, this statement to be properly executed before a notary public. The Contest Committee reserves the right to check the measurements of any engine entered, and to demand the removal of a cylinder for this purpose. In case there is a question of a cubic inch displacement of an engine the Contest Committee reserves the right to use the cylinder displacement figures given for such engine by the Engineering Division, McCook Field. The decision of the Contest Committee will be final.

(f) General conditions and design of plane to be such that in the opinion of the Contest Committee it is safe and not a menace to other contestants or spectators. The Contest Committee reserves the right to refuse to admit any airplane which does not comply with these requirements.

DISTANCE:

300 kilometers (186.42 miles)—six times around a closed course of 50 kilometers (31.07 miles), starting at St. Louis Field and north to first pylon, then southwest to second pylon, then east passing over captive balloon located approximately 5 miles east at about 1500 ft. altitude, continuing east to St. Louis Field.

WINNER:

Of first place shall be the pilot who has completed the full course in the shortest elapsed time, and of second place the second best time, etc., provided the pilot is not disqualified. Merchants Exchange of St. Louis Trophy will be awarded to the entrant of the winning airplane and the prize money paid to the entrants of the winning airplanes.

NUMBER OF CONTESTANTS:

Minimum number: Four.

Maximum number: Forty.

CASH PRIZES:

First prize $1,000, second prize $700, third prize $300.

Mulvihill Model Trophy

Tuesday, Oct. 2, 1923

The trophy shall be perpetual and competed for annually by members of the Junior Flying League of the National Aeronautic Association, using hand launched model airplanes, driven by rubber strand motors.

The contest shall be in the nature of a duration race, and shall be conducted under rules governing such race, as may be prepared from time to time by the Contest Committee of the National Aeronautic Association. The Contest Committee, with the consent of the Board of Governors, shall have the privilege of conducting each annual contest for the Mulvihill Model Trophy or of assigning this privilege, under sanction, to any other organization.

The trophy shall be awarded each year to the club, body or chapter represented by the entrant of the winning model, and this body shall be entitled to the possession of the trophy until one month prior to the next succeeding contest, at which time the trophy shall be returned to the National Aeronautic Association; suitable bond for its proper care and return shall be required by the donee, from each and every person or organization into whose possession the trophy shall at any time be delivered.

Silver and bronze plaques (miniatures of this trophy) will be given by the donee to the owners of the models winning first and second place in every contest for this trophy.

CONDITIONS OF CONTEST:

No restrictions on the design of the model except that they shall have a wing span of not to exceed 40 in. All models must be hand launched and the only motive power will be that derived from the use of rubber strands.

A contestant may be allowed three trials and will be accredited with the greatest time made in any one of the three trials.

NUMBER OF ENTRIES:

No contestant will be allowed to enter more than three models.

WINNER:

The winner of first place shall be the owner and builder of the model which has remained in flight for the longest elapsed time, and of second place the second longest elapsed time, etc., providing the contestant has not been disqualified.

QUALIFICATIONS:

No contestant may take part in the contest for this Trophy unless he is a member of the Junior Flying League of the National Aeronautic Association, and in good standing. He must also be the owner and builder of the model submitted; however, the design for the model may be obtained from other sources than his own. He shall be the builder of the entire model with the following exceptions: Propellers, motor bearings and propeller shaft; also such other small metal fittings as may be used in the construction of the model may be purchased from outside sources.

DISQUALIFICATIONS:

Any contestant breaking the rules of the race, or subsequent ones which may be sent out in writing, shall, upon the recommendation of the judges, be disqualified. Models broken upon landing will *not* be disqualified.

Detroit News Air Mail Trophy

Wednesday, Oct. 3, 1923

The Detroit News Air Mail Trophy, donated by the Detroit News to the National Aeronautic Association, shall be competed for annually by airplanes or flying boats.

Such annual contest shall be in the nature of a race either around a closed circuit or from point to point and shall be conducted under such rules governing such race as may be prepared from time to time by the Contest Committee of the National Aeronautic Association.

The Trophy shall be awarded each year to the Aero Club or chapter of the N.A.A. represented by the pilot of the winning machine, and this body shall be entitled to the possession of the Trophy until one month prior to the next succeeding contest, at which time the Trophy shall be returned to the National Aeronautic Association; suitable bonds for its proper care and return shall be required by the National Aeronautic Association from each and every person or organization into whose possession it shall at any time be delivered.

Gold, silver and bronze decorations will be given to the pilot winning first, second and third places.

CONDITIONS OF CONTEST:

(a) Factor of safety of wing cellule as loaded for start of race: 4 low incidence condition; 6 high incidence condition.

(b) Air speed greater than 90 m.p.h.

(c) Capable of carrying pay load of 800 lb. or over at a minimum climb of 500 ft. the first minute. The Contest Committee reserves the right to require the contestant to demonstrate by actual flight test that his plane can meet these requirements. This load will not be carried during the race.

(d) "Contest load": All airplanes during the race will carry pilot and gas, oil and water sufficient for the race.

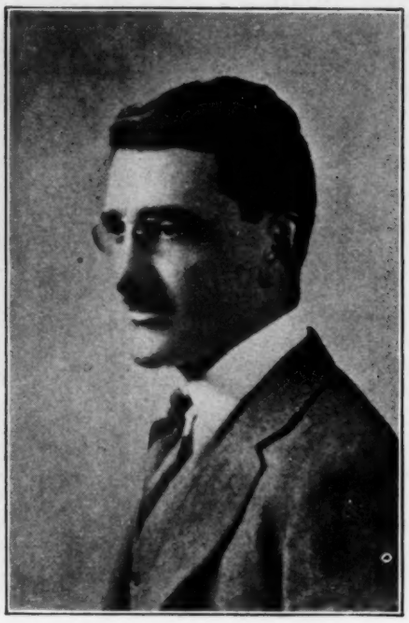
(e) Only pilots of the U. S. Air Mail Service are eligible for this race and must use regulation plane built for Air Mail Service and equipped with single Liberty engine.

The Contest Committee reserves the right to refuse to admit any airplane which does not comply with the requirements.

DISTANCE:

300 kilometers (186.42 miles)—six times around a closed

W. Frank Carter, General Chairman, St. Louis Air Board.



Joseph Pulitzer, Member, Executive Committee, St. Louis Air Board and one of the donors of the Pulitzer Trophy.

Maj. Albert B. Lambert, pioneer balloonist and member, St. Louis Air Board

course of 50 kilometers (31.07 miles) starting at St. Louis Field and north to first pylon, then southwest to second pylon, returning east to St. Louis Field.

WINNER:

Of first place shall be the pilot who has completed the full course in the shortest elapsed time, and of second place the second best time, etc., provided the pilot is not disqualified. The Detroit News Air Mail Trophy will be awarded to the Aero Club or Chapter of the N.A.A. represented by the winning pilot and the prize money paid to the entrants of the winning airplanes.

NUMBER OF CONTESTANTS:

Minimum number: Four.

Maximum number: Forty.

CASH PRIZES:

First prize $800, second prize $500, third prize $200.

Pulitzer Trophy

Wednesday, Oct. 3, 1923

The Pulitzer Trophy, donated by Ralph Pulitzer, Joseph Pulitzer, Jr., and Herbert Pulitzer to the National Aeronautic Association, shall be perpetual and competed for annually by airplanes, and shall be awarded each year to the Aero Club or Chapter of the N.A.A. represented by the pilot of the winning airplane, and this body shall be entitled to the possession of the trophy until one month prior to the next succeeding contest, at which time the trophy shall be returned to the National Aeronautic Association. The Contest Committee of the National Aeronautic Association, with the consent of the Board of Governors, has the privilege of conducting each annual contest for the Pulitzer Trophy or of assigning this privilege, under sanction, to any other Club or organization.

Gold, Silver and Bronze plaques will be given by the donors to the pilot winning first, second and third places in every contest for the Pulitzer Trophy.

CONDITIONS OF CONTEST:

(a) Factor of safety: 7½ as loaded for start of race.

(b) Air speed greater than 175 m.p.h. as loaded for start of race.

(c) Stalling speed not to exceed 75 m.p.h. in still air. This can be calculated theoretically, and it is a condition of this contest that each entrant file with the Contest Committe not later than Sept. 1, the following data:

(1) Weight of machine ready to fly (with pilot at 180 lb. and full fuel load for the Pulitzer route).

(2) Total lifting surface of wings.

(3) Profile of section used.

(4) Characteristic curve showing maximum *Ky* derived from rectangular wing model of the section used, size 3 in. by 18 in., approximately. Tested at a speed of 40 m.p.h. in a wind tunnel not less than 4 ft. diameter. The test to be made in a tunnel of recognized standing.

The Contest Committee reserves the right to weigh any plane as a check against the figures submitted, also to measure and otherwise check the profile of the wing used.

(d) Visibility and maneuverability (land and air) which, in opinion of Contest Committee, is not a menace to the other contestants or spectators.

All planes in this race must leave the ground under own power only, must not discard any part of its equipment in flight and must have proper landing equipment attached at all times.

DISTANCE:

200 kilometers (124.27 miles), four times around a closed course of 50 kilometers (31.07 miles), starting at St. Louis Field, thence north to first pylon, thence southwest to second pylon and east to St. Louis Field.

WINNER:

Of first place shall be the pilot who has completed the full course in the shortest elapsed time, and of second place the second best time, etc., provided the pilot is not disqualified. The Pulitzer Trophy will be awarded to the Aero Club or Chapter of the N.A.A. represented by the winning pilot and the prize money paid to the entrants of the winning airplanes.

NUMBER OF CONTESTANTS:

Minimum number: Four.

Maximum number: Forty.

CASH PRIZES:

First prize $2,000, second prize $1,500, third prize $500.

An Aeronautical Survey of South America

Great Opportunities Await Constructors, Pilots and Capitalists South of the Panama Canal

The following notes on the present situation of aviation in South America, and on the opportunities that continent offers to aerial enterprises are excerpts from a lecture given March 5, 1923, by George F. Luke, F.R.G.S., to the Scottish Branch of the Royal Aeronautical Society. As the lecturer recently returned from a business tour of the South American Republics, his observations have, in addition to their keenness, the merit of being up to date. American aircraft manufacturers will do well to ponder his conclusions, where he says: "Great opportunities await the aircraft constructor, the pilot and the capitalist in South America. The continent is developing fast, and the means of transport essential to that development are slow. The people, unhandicapped by tradition, take to aviation with probably better grace than did our forefathers to the railway."—EDITOR.

Argentina

The Argentine Republic is the second largest country in South America, and has a population of 9,500,000, of which 2,275,000 are to be found in the Province of Buenos Aires.

Great enthusiasm was shown during 1919 and 1920 in aviation generally, but in 1921 this dwindled somewhat, owing chiefly to the general crisis which swept the country, and also to the failure of the French and Italian Missions to weather the storms. The year 1922 saw a recrudescence of interest, due mainly to the initiative of the Army Aviation Authorities, who put forward a scheme for the establishment of air routes throughout the Republic. The hub of these services was to be at the Military Airdrome of El Palomar, the spokes leading to outlying stations to be created at Monte Caseres, Rosario, Salta, Cordoba, Mendoza, Neuquen and Gallegos, besides which 22 secondary stations and 126 emergency landing grounds were projected. The negotiations between the Ministry of War, the Postal Department and the Ministry of Commerce, in regard to this project, were still in progress at the time of my departure.

Military aviation has made great progress, being well-organized and equipped with modern craft. The training at El Palomar is most efficiently carried out, and real merit is to be found among the instructing officers and pilots. At the recent maneuvers three squadrons, one bombing, one fighting and one reconnaissance and spotting, took part, and it was considered by military attachés present that a degree of efficiency was shown equal to that to be found among many European countries today, and while the Brazilian Air Force is numerically stronger than that of Argentine, it is not, as yet, nearly so well-trained.

The Naval Air Force is not so far advanced as that of the Army. Training is carried on at San Fernando, the seaplane station, but it would appear that the Army has a much greater pull on the purse-strings of the Nation than the Navy. The machines in use are nearly all Curtiss flying boats, but there are also a few French machines.

The British, French and Italians seem to be anxious to start freight, passenger and mail services to various parts of the country, provided that they are given the exclusive right to exploit their chosen route, but the Government does not appear willing to grant such rights.

Major Kingsley, formerly an R.A.F. officer, arrived in the country in 1919 and formed a company called the Sociedad Rio Platense de Aviacion. This company has operated for the last two years a successful cross-river service between Buenos Aires and Montevideo carrying mails and passengers. The service has only been worked during the summer months, the rest of the time being taken up with joy-rides and the training of pilots, and the company possesses an excellent airdrome at S. Isidro. Last season it was found that the distance from the town to the airdrome, some 40 min. by electric car or an hour and a quarter by motor car, over what are termed roads, was often too much for a prospective passenger to face. The same time was lost at the Montevideo end. To remedy this, Major Kingsley visited England and purchased a number of Vickers amphibians so that in future the service will start from the North Basin, Buenos Aires, and finish in the Harbor at Montevideo, and vice versa. This means that the journey will be done in 1 hr. 30 min. from hotel to hotel as against 2 hr. 25 min., a very considerable saving.

This new service should be of great commercial utility. The actual flying time should not exceed 65 min., and always provided that the fares charged are not too high, the line will be patronized and become a paying proposition. Another source of revenue to this company is the private chartering of airplanes by rich *estancieros* to take them back from the capital to their estancias (ranches). By train such a journey often takes 24 hr., after which there may be a four or five hours' ride on horseback. By airplane the whole distance can be done in four or five hours, and the question of a landing-ground, as a rule, presents no difficulty owing to the general flatness of the country. Altogether, the Rio Platense Co., since its foundation, has carried nearly 15,000 passengers and flown over 400,000 kilometers, a very creditable performance.

Another company, started by the Italian Constructor Caproni, called the Italo-Argentine Aerobus Co. "Caproni," intends opening a service between Buenos Aires and Montevideo. It is alleged that they are to use giant Capronis carrying 23 passengers and 3½ tons of cargo.

The German-Spanish scheme for a Zeppelin line from Seville to Buenos Aires is beginning to take shape. The service is to be maintained by two airships having 135,000 cubic meters' capacity, measuring 250 meters long and 34 meters in diameter. They are to have accommodation for forty passengers and eleven tons of cargo. The duration of the voyage is to be 3½ days westward and four days eastward, and the fare will be Ptas. 6,000 or £200. Airports are in course of construction at the two termini and include hangars 300 meters long and 50 meters high. Both ports are well equipped with shops for undertaking repairs, and will also have wireless.

Capt. René Fonck, who paid a visit to the Argentine after Brazil, outlined a scheme for an airplane service from Paris to Buenos Aires. A committee of influential people was formed to study the best means of carrying it out.

Uruguay

Uruguay, with a population of only a million and a half, and an area of 72,210 sq. miles, is the smallest of all the South American Republics. Actually there is no Air Service, either naval or military, that could be called as such, but the army possesses a few obsolete British and French machines, mainly used for training purposes. There is a military aviation school near Montevideo, and the head of this school has just returned from a mission to France, where he purchased six new Nieuports and a quantity of spare parts to the total value of half a million francs. This may not seem a great deal, but as their standing army only amounts to 10,000 officers and men, it is sufficient to form the nucleus of an efficient Military Air Service.

An Air Convention has been signed between the Uruguayan and Argentine governments regulating the traffic between the two capitals, and the negotiations between the Postal Authorities of the two countries have been brought to a satisfactory conclusion.

The possibilities of successfully running airplane or seaplane services in Uruguay itself, for mail or passenger traffic are not good. The railway and telegraph communications with the interior are admittedly bad, but on the other hand,

the population in the country districts is scanty, for out of the total population of 1,500,000 a third of this is in Montevideo itself. An international service from Montevideo to Asuncion, the Capital of Paraguay, with halts at Colonia (Uruguay), Parana (Argentina), Corrientes (Argentina) and Formosa (Paraguay), might be a paying proposition for the future.

Brazil

Brazil, which is the largest of the South American Republics, has a population of over 30 millions and an area of 3,291,416 sq. miles, and is the fourth largest country in the world.

It has a well-trained Naval and Military Air Force, each operated separately, amounting to some ten squadrons in all, the Naval side being trained by the Americans and the Military by the French. The machines in use are either American or French, the Navy having mainly Curtiss flying boats and the Army, Hanriot, Spad, Farman, Morane Saulnier, and some obsolete Nieuports and Caudrons. There are naval aviation schools at Rio de Janeiro and Porto Alegre, and a military flying school at Sao Paulo, and others are to be established as soon as the finances of the country permit.

Of commercial services there are actually none, but two semi-commercial routes are projected from Rio to Porto Alegre, the one along the coast touching at Santos, Paranaguà and S. Miguel, and the inland one calling at Sao Paulo, Curitiba and Camizas. These services at the present are intended primarily for use of the Naval and Military Air Forces, and will be organized and controlled by the Ministry of Marine and Ministry of War, respectively, but the facilities they afford will be available for civil and postal purposes. The Government is authorized to borrow up to 4,000 contos of milreis or £200,000 to cover the cost of the two schemes. A passenger and freight service between Porto Alegre and Montevideo, Uruguay, serving various centers between these two ports was projected, but lack of financial support caused the project to fall through.*

The prospects for running airplane or flying boat services for mail and passenger traffic are fairly good, inasmuch as there is extensive territory not served by railroads, and the coastal boat service between the smaller ports is uncomfortable and irregular, but drawbacks would be found in the difficulty of transporting material and fuel to outlying airdromes, and in the unsuitability of the ground traversed for forced landings.

The only foreign air missions are those already mentioned, i.e., the United States Mission for training the Navy and Naval Air Service, and the French Mission for training the Army and Military Air Service. During the Centenary Celebrations Capt. René Fonck and Lieutenant Fronval came out to Rio on a special mission of aeronautical propaganda, chiefly in the interest of the French Aircraft Constructors. They had with them four airplanes, two of a commercial type, Bréguets, and two fast Spads, and they gave one of the finest exhibitions of acrobatic flying ever witnessed before a crowd of 200,000 people. Thus does the French government help its aircraft industry.

Joy-riding is carried on to a small extent by Orton Hoover an American, at Rio and Mlle. Boland, of trans-Andes fame, runs a ferry service from Rio across the Bay to Nichteroy, a distance of 6½ miles.

There are four civil schools in the Sao Paulo district which train pilots for the Army under contract from the Ministry of War. They are: the Escola de Força Publica, using Curtiss Oriole machines; the Escola Campineira, using Caudron machines; the Escola Curtiss (run by Orton Hoover), using Curtiss machines; and the Escola Brasil, using Aviatic machines.

Chile

Chile, with an area of 307,774 square miles and a population of some 4,500,000 has the only Air Force in South America which can be said to be modelled solely on British lines, and using only British material. The Naval Service, whose temporary bases are at Valparaiso and Quinteros, has been trained under Lt.-Col. J. L. Travers, late R.A.F., with two British mechanics. The material consists of three Avros, four Shorts and two Sopwith seaplanes, also two Supermarine Channel Type flying boats.

The Military Air Service, which was trained by a British mission headed by Major Scott, late R.A.F., has its headquarters at the airdrome Lo Espejo, near Santiago, and the military aviation school is at El Bosque, which is next to Lo Espejo. The school is housed in a fine large building, and is well equipped to teach the latest improvements invented for safe flying, as well as the usual military routine, including directional wireless and wireless telephony. On the airdrome are hangars built of reinforced concrete capable of holding ten or twelve machines of the Avro or Bristol type, and there is also an observatory and meteorological office. The material consists of ten Avros, eight SE5, eight Bristol monoplanes, twenty DH9's and two Italian SVA's. There is also a well equipped repair shop employing some 25 mechanics. All the afore-mentioned British machines were presented to Chile by Great Britain in part payment for the use during the War of the Chilean battleship Latorre, re-named during the war the Canada.

As regards Commercial Aviation, this does not exist at present. The principal difficulty in the way of establishing air routes in Chile is its configuration, which renders forced landings extremely hazardous, and might exclude the use of the airplane except for the Valparaiso-Santiago route. A service between Valdivia and Iquique, with calls at Talcahuano, Valparaiso, Coquimbo and Antofagasta, has been mooted by people representing British and French interests using flying boats. The difficulty, however, is that, with the exception of Valparaiso and Talcahuano, the ports mentioned have no harbors, and the almost perpetual heavy swell experienced along the West Coast would make the landing at different ports somewhat perilous. Such a service, however, if it could be worked, would be an inestimable boon to the trade of the country, as at the present time the communications for mail and passengers are slow and erratic.

Peru

Peru, which has an area of 439,014 sq. miles and an estimated population of 5,000,000, possesses the nucleus of an efficient Air Force, under Comandante Juan Leguia, son of the President, who served with the British in the 7th Squadron R.N.A.S. during the Great War and won the D.F.C. The Naval Service has been trained by Capt. W. Simon of the U. S. Navy and uses mainly Curtiss flying boats.

The Military Air Service under the control of Comandante O'Connor, a Peruvian of Irish descent, uses British, French and Italian machines. It is not so efficient as the naval side, but in the summer of last year Comandante Leguia visited Great Britain and made considerable purchases of material, securing also the services of Major Marsden, late R.A.F., to act as Chief Instructor.

In 1919 the French sent out a mission, but in January, 1920, its chief crashed and was killed, and this took away a great deal from their prestige. The Italian firm of Ansaldo had a mission in Peru, and succeeded in getting two of their machines purchased by public subscription and presented to the Nation.

The principal airdromes are at Lima and Arequipa.

Turning now to Civil Aviation, there is one commercial aviation company, the Compañia Nacional Aeronautica, Lima, which was formed in July, 1920, with American capital, and they are agents of the Curtiss Co. They started a service between Callao and Lima, but this had to be abandoned owing to lack of support, the reason being that there is an excellent tramway service between the two towns taking only 25 min. A mail service along the coast has been mooted, but nothing has so far materialized, owing to lack of capital, and also on account of the heavy Pacific swell, making landing difficult.

In considering possible air routes, apart from the coastal one, the most important that immediately strikes one is that of linking up the Pacific with the inland port of Iquitos, 2,175 miles up the Amazon from the Atlantic coast and 630 from the Pacific. In 1918 Squadron-Commander G. M. Dyott,

*An air transport company was recently formed in Rio de Janeiro for the purpose of operating mail and passenger services between that city and Recife (Pernambuco) with possible extensions to the Amazon and to Buenos Aires. Junkers monoplanes are to be used.—EDITOR.

R.N.A.S., made the extremely hazardous journey from Pacasmayo to Iquitos to make an air-route reconnaissance of the country from the coast to the latter town. The four possible routes were as follows:—

1. The Pichis trail from Lima to Oroya and thence to Iquitos.—Flying distance, 750 miles; present time, 32 days; flying time, 9½ hr.
2. Trujillo via Soledad and Parcoy, thence by the Huallaga River to Iquitos.— Flying distance, 590 miles, present time, 40 days; flying time, 7½ hr.
3. Pacasmayo, Chachapoyas, Balza Puerto and the Huallaga River to Iquitos.—Flying distance, 690 miles; present time, 64 days; flying time, 8½ hr.
4. Paita or Chiclaya to Bellavista, thence through the Pongo de Manseriche to Iquitos.—Flying distance, 630 miles; present time, 92 days; flying time, 8 hr.

Of these the fourth would appear the easiest on account of the lower height of the Andes, at this point some 8,000 ft., and the possibility of utilizing the Rio Marañon for alighting in case of necessity.

In the latter part of last year an American aviator named Faussett practically accomplished this flight, using route No. 4 as suggested by Commander Dyott. He left Chiclayo and flew 436 miles non-stop to within 60 miles of his destination, being forced to land in a violent storm at the point where the Rio Tigre joins the Marañon. He accomplished this remarkable flight on a Curtiss Oriole with a 90 hp. Curtiss engine, taking only 6 hr.

The difficulty in establishing such a route would, of course, be the groundwork. Supplies and landing-places, whether on land or water, would require to be established about every 200 miles, those on the east of the Andes being supplied from the Atlantic coast, and those on the west from the Pacific. Amphibian machines would be required, and the capital necessary about £250,000, as against £9,000,000 for building a railway. The benefits of such a service are obvious, as it would bring this important area within 12 hr. of the Pacific coast instead of 32 days as at present.

Colombia

Naval or Military Aviation cannot be said to exist as yet, the activities in this connection being confined to a school for training pilots with French machines and French instructors. The lack of the third arm, however, is amply couterbalanced by the wonderful progress that has been made in Commercial Aviation, both for the carrying of mails and passengers.

No other country in South America, and few in Europe, possesses such a complete system of air mails as does Colombia, and this is mainly due to the lack of competition from other means of transport and the eminent suitability of the configuration of the country for aerial communication. The advent of the airplane and flying boat has been instrumental in solving a problem which seems almost insoluble by other means.

Before aerial transport was established the sole artery of communication with the interior was the Magdalena River which is navigable for some 600 miles as far as La Dorada. The shifting sands and shallow draft, however, made the duration of such a journey a matter of conjecture, and mail matter from this country often took as much as five or six weeks, so that it is possible to get a reply to a letter in the same time that it previously took that letter to arrive at its destination. Air mail services are now operated by the Colombian-German Air Transport Co. on the following schedules:

Barranquilla to Girardot.—This is a bi-weekly service leaving Barranquilla every Tuesday and Friday and arriving at Girardot the same day, a distance of some 350 miles, with stops at Monpox, Barranca, Bermeja, Puerto Berrio and Honda for the delivery of mail. From Puerto Berrio, the port on the Magdalena for Medellin, the mail is taken by special messenger to the latter town, and the same is the case at Honda to Manizales, and at Girardot for Ibague, Bogota and Tunja. Mail forwarded by air arrives at Medellin, Iabgue and Bogota on Wednesdays and Saturdays, and at Manizales, Neiva and Tunja on Thursdays and Sundays. Letters addressed to other cities in the interior of the Republic are landed at the river port nearest to the National Post Office of the district in which the town is situated.

Girardot-Barranquilla.—This service is the same as the foregoing, only reversed, the departure being on Wednesdays and Saturdays. The Wednesday service makes connection with the Clyde Line steamers sailing on Fridays from Puerto Colombia to New York. Mail from Bogota to New York takes fourteen days. It also connects with Elders and Fyffes' steamers leaving on Thursdays and Saturdays from Santa Maria for Bristol, mail taking by this route 20 days from Bogota to London.

Barranquilla and Cartagena.—This service flies every Monday, returning to Barranquilla the same day in time to make connection with the Tuesday Barranquilla and Girardot service.

Barranquilla and Santa Marta.— This service is the link between the Barranquilla and Girardot line and Elders and Fyffes' steamers. The airplanes leave Barranquilla every Thursday and return the same day to connect up with the Friday Barranquilla and Girardot service.

The airways represent a total length 1,250 miles. The charges for mail are rather high, being 1s. 2½ d. per ½ oz., but the saving in time is enormous.

The Colombian-German Air Transport Co. has a contract with the Government to carry the mails for five years, being subsidized to the extent of $100 or £20 per trip from Barranquilla to ports on the Magdalena River. During the three months ending October this company made 307 flights, totalling 57,640 km., carrying 303 passengers and 29,280 kilos of mails and freight. All the machines used are German Junkers monoplanes. For a country with only five millions of population this is a wonderful record.

Great opportunities await the aircraft constructor, the pilot and the capitalist in South America. The continent is developing fast, and the means of transport essential to that development are slow. The people, unhandicapped by tradition, take to Aviation with probably better grace than did our forefathers to the railway. The meteorological conditions are far better than those found in Europe. With a return of general trade to something like its pre-war prosperity, South America should prove a large and steadily increasing buyer of aircraft, but it will want the very latest in design and construction, not surplus war stock.

British Assistance to Racing Aircraft

The British Air Ministry announces that with a view to encouraging the entry by British aircraft constructors of British racing aircraft in international air races the Air Council has undertaken in this and future years until further notice to purchase for a sum not exceeding £3,000 in each case, the winning aircraft (without engine) in both the Aerial Derby and the Schneider cup races, provided that the aircraft is, in each case, British designed, built, and owned, and is not of a type which has previously won either race.

The Air Council considers that the production of aircraft capable of winning these events represents a definite advance in design, and official experiments will be undertaken after the purchase so that the full research and military value of the machine may be obtained.

The Aerial Derby is an international race, which is being held this year at Hendon on the August Bank Holiday, open to any type of landplane or amphibian. The Schneider cup race, which will take place this year at Cowes on Sept. 27 and 28, is the principal international race open to seaplanes or amphibians.

Aircraft in Warfare

In the campaign Spain is waging against the rebellious Riff tribes in Northern Morocco military aircraft are used to great advantage. The Spanish air forces in Morocco are said to consist of five squadrons of twelve planes each, mostly of French and British manufacture.

In a recent encounter the Spaniards used three fighting squadrons to break up and disperse a rebel concentration which suffered severe casualties from aircraft bombs and machine gun fire.

National Balloon Race Entries

The following entries were received by the Contest Committee of the National Aeronautic Association for the 14th National Balloon Race which will be held from Indianapolis on July 4:

1. Roy F. Donaldson, pilot, and P. A. Erlach, Springfield, Ill., aide. Probably standard varnished balloon.
2. Lieut. James B. Jordan, A.S., pilot, Scott Field, and Lieut. Max F. Meyer, A.S. aide, Akron, Ohio. A.D.C. type balloon.
3. Capt. Lester T. Miller, A.S. pilot, and Lieut. Courtland M. Brown, A.S. aide; Scott Field, McCook Field type balloon.
4. Lieut. Robert S. Olmstead, A.S. pilot, Middletown A.I.D.; and Lieut. John W. Shoptaw. A.S. aide, Chanute Field. McCook Field type balloon.
5. Ralph Upson, pilot, and C. G. Andrus, aide; Aircraft Development Corp., Detroit. A.D.C. type balloon.
6. Warren Rasor, pilot, Brookville, Ohio, and H. H. Rasor, aide, Brookville, Ohio. Probably standard varnished balloon.
7. Lieut. J. B. Lawrance, U.S.N. pilot, and Lieut. F. W. Reichelderfer, U.S.N. aide; Washington, D. C. Goodyear standard balloon.
8. Lieut. F. B. Culbert, U.S.N. pilot, and Lieut. T. D. Quinn, U.S.S. aide, Hampton Roads naval air station. Goodyear standard balloon.
9. Lieut. L. J. Roth, U.S.N. pilot, and Lieut. T. B. Null, U.S.N. aide; Lakehurst naval air station. Goodyear standard balloon.
10. Lieut. Cmdr. J. P. Norfleet, U.S.N. pilot, and Lieut. J. B. Anderson, aide; Lakehurst naval air station. Goodyear special balloon.
11. J. A. Boettner, pilot, and J. M. Yolton, aide; Goodyear Tire & Rubber Co., Akron. Goodyear standard balloon.
12. Capt. C. E. McCullough, A.S.O.R.C., pilot, Baltimore; and Lieut. Carlton R. Bond, A.S., Aberdeen. Italian type balloon. American Legion entry.

At the last minute the entry of H. E. Honeywell is announced. His aide is not yet known. Mr. Honeywell finished second in last year's National Balloon Race and also in the Gordon Bennett International Balloon Race. The entry of Wade T. Van Orman, pilot, with Herbert V. Thaden as aide, is also announced.

Aeronautical Chamber of Commerce

Increase in Membership

Realization of the increasing importance of the activities of the Aeronautical Chamber of Commerce of America, is evidenced by its constantly growing membership. The Chamber was organized a little more than a year ago with 100 members, which has since increased 150 per cent, there now being about 225 members. Among those recently acquiring membership are the following:

Aircraft Development Corp., General Motors Bldg., Detroit.
American Gas Accumulator Co., Elizabeth, N. J.
Dayton Wire Wheel Co., Dayton, Ohio.
Eberhart Steel Products Co., 812 E. Ferry St., Buffalo, N. Y.
Great Lakes Aerial Photographic Co., 11511 Mayfield Rd., Cleveland, Ohio.
Haskelite Mfg. Corp., 819 Chamber of Commerce Bldg. Chicago.
Luftschiffbau-Zeppelin, Mr. Harry Vissering, American Rep., 14 E. Jackson Blvd., Chicago.
Sperry Gyroscope Co., Manhattan Bridge Plaza, Brooklyn, N. Y.
Stromberg Motor Devices Co., 64 E. 25th St., Chicago.
U. S. Touring Information Bureau, Inc., Waterloo, Iowa.
Wamsutta Mills, New Bedford, Mass.
Wyman Gorden Co., Worcester, Mass.
The Skywriting Corp. of America, 50 East 42nd Street, New York City.
Fritz Cremer, 1111 First Nat'l. Bk. Bldg., Milwaukee.
Richard H. Depew, 136 W. 52nd St., New York City.
Orton Hoover, Curtiss Aeroplane Export Corp., c/o U. S. A. Consulate, Rio de Janeiro, Brazil.
C. S. Jones, Curtiss Aeroplane & Motor Corp., Garden City, N. Y.
Thomas Hart Kennedy, 1201 B'way, Normal, Ill.
Lawrence Leon, Curtiss Aeroplane Export Corp., 818 Via Monte, Buenos Aires, Argentina.
Stephen J. McMahon, 1111 First Natl. Bk. Bldg., Milwaukee.
S. Albert Reed, 113 E. 55th St., New York City.
Fred M. Ruddell, Kokomo, Ind.
H. Von Thaden, Aircraft Development Corp., General Motors Bldg., Detroit.

Amundsen Abandons Polar Flight

Capt. Roald Amundsen has abandoned his proposed flight across the North Pole by airplane, it was announced June 18, in Christiania, by the Norwegian Minister of Defense.

The Minister received a message from Leon Amundsen, brother of Roald, reading:

"Just received the following telegram, dated Norwick, Alaska: 'Trial flight held May 11. Result very unsatisfactory. Sorry forced to abandon proposed flight. Have written.' "

Captain Amundsen planned to start in an airplane from Wainwright, Alaska, or from Cape Barrow, 75 miles northeast, and with his aviator, Lieut. Oskar Omdal, dash above the North Pole and land in the Spitzbergen Islands, in the Arctic Ocean, 600 miles north of Norway.

Starting from Seattle last June in the exploration ship Maud, he passed the Winter at Nome, leaving there in April for Wainwright, whence he expected to start his airplane flight this month. Before he left Nome he indicated he planned to take off on June 20, or as near to that date as the weather would permit. The airplane for the flight was left at Wainwright during the Winter after Captain Amundsen had quit the Maud, which at latest advices was locked in the Arctic ice pack with the probability that she was drifting slowly toward the Pole.

Preparations had been made by the Norwegian Government and Captain Amundsen's assistants to meet him in Spitzbergen, or to get aid to him, if possible, should mishap overtake him during the flight.

New British Aircraft Carrier

According to an Associated Press dispatch from London, the British Admiralty has laid down a new type of aircraft carrier which has two decks connected by huge lifts. The upper is the airdrome deck, and the lower is equipped with workshops for carrying out repairs. There are also supplies of necessary spare parts, ranging from a propeller to a complete engine, all ready for instant use.

The flying deck is fitted with a search-light and landing-light tower, which make it possible for a machine to land at night. There are also cranes for hoisting on board flying boats which need repair.

It is now possible for the fastest machines to land with safety on the deck of an airplane carrier. An arrangement of nets brings the airplane to a standstill without danger, and a machine which attains a speed of three miles a minute can land in a distance of not more than forty feet.

Helicopter Hovers 9 Min.

The helicopter of Etienne Oehmichen in its latest trials is reported to have lifted three persons to a height of five metres. The machine also twice rose with the same number of passengers to heights of three to five metres.

The Oehmichen helicopter has been making records steadily since its construction. It now has to its credit a total of 2 hrs. in flight, with one flight of 9 min. It also accomplished a horizontal flight of 400 metres.

After the engine, which was worn out, is changed, the inventor will attempt a kilometer flight in a closed circuit which is one of the trials prescribed by the French air department for purchase of the machine.

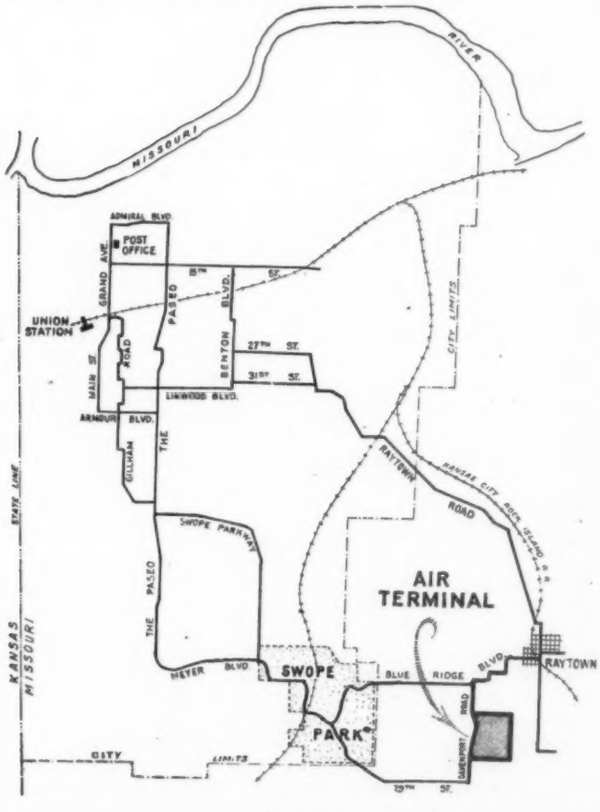
AIRPORTS AND AIRWAYS

Kansas City Airport

Richards Field, as the Kansas City airport is named in memory of Lieut. John F. Richards, A. S. a Kansas Citian who was shot down in action over the Argonne, Sept. 26, 1918, was established in the late fall of 1922 by the Air Terminal Association of Kansas City which was specially organized for this purpose. The flying portion of Richards Field was leased to the Government, together with sufficient space for hangars, machine shops, buildings for personnel, etc. Since that time two expeditionary type hangars and an oil house with 10,000 gal. capacity for gasoline and 1,000 gal. capacity for oil have been erected. The Air Terminal Association, in addition, has erected a steel hangar with a capacity for ten ships.

Richards Field began its operations on Dec. 1, 1922, when all of construction work was completed. During the month of May approximately fifty transient ships of all types passed through the field. These included six Martin bombers, the T2 transcontinental ship, Laird Swallows, Curtiss Orioles, Lincoln Standards, JN4s and 6s, with destinations all over the country, Kelly Field, Tex., Buffalo, N. Y., Paducah, Ky., Rantoul, Ill., New York City, Denver, Colo., Quantico, Va., Hot Springs, Ark., Dayton, Ohio, Des Moines, Iowa, Chicago, Detroit, and numerous other points. Approximately 75 passengers were carried cross country.

Commercial pilots seem to be very well pleased with the business they have been getting at the field. Sundays when the weather is at all good there is as a general rule large crowds varying from 1,500 to 4,000. The general public also seems to have more confidence in flying, as they are riding freely, both sightseeing and cross country.



Sketch map showing location of the airport of Kansas City with reference to the Mississippi River.

At the present time there are fourteen ships operating from the field and many inquiries have come in for space for ships in the next two or three months.

Lt. Jas. B. Carroll, A. S. is in charge of government air activities at the field. Lieut. Carroll has received authority to employ five mechanics for the care of the ships which will be at Richards Field for the use of the Reserve Pilots. These ships include nine JNH's from Fairfield A. I. D. where they were reconditioned.

Fifteen ships of various types have been ordered to Richards Field to take part in combat maneuvers for the benefit of the officers in staff School at Leavenworth. They will be sent from Kelly Field, Texas, and include Thomas Morse MB3's, Martin bombers, DH's, etc.

The 16th Observation Squadron from Ft. Riley has received orders and will be at the field on June 18 to get ready for the summer camp. They will stay here until Aug. 1.

Air Line Markings

The use of distinct "house markings" by means of which air liners could easily be identified by persons who, though interested in aviation, lack the necessary technical knowledge to distinguish one type of ship from another, is spreading.

After the Aeromarine Airways, which adopted a black rudder with white wings and hull—hence the nickname "Black Tail Air Line"—the New York-Newport Air Service now follows suit, having adopted as their house marking a light blue diagonal band across the wings and the hull. The blue band stands for "Blue Streak Air Line", the meaning of which is self-explanatory.

Woman Flies High

Mlle. Andrée Peyre, a French aviator, who has been in this country for some time, recently made an unofficial altitude record for women when she reached a height of 15,000 ft. over Rogers Airport, Los Angeles. Her flight, which was made in a special 70 hp. sport plane, beats the previous mark made by Miss Amelia Earhard in Kansas by 1000 ft.

Mlle. Peyre has been flying for two and a half years, mostly in America. She is engaged to marry Capt. Cyril Turner, formerly R.F.C., who gave the first skywriting demonstration in the United States and is now engaged in this work for the Skywriting Corp. of America.

Good Aviation Propaganda

The Chicago *Uptown Times* recently completed the first anniversary of its aeronautical department, called "Along the Air Lanes" which is ably conducted by Otto Klein. In this connection and with a view to furthering public interest in aviation, the *Uptown Times* offers a free airplane ride to all who obtain six yearly subscriptions to that newspaper.

Our contemporary is to be congratulated upon the excellent aeronautical propaganda it is making among the citizens of Chicago.

Emergency Landing Field at Aberdeen

Operations and Engineering officers at the Aberdeen Proving Grounds, Md., are reconditioning and marking an emergency landing field in the vicinity of the bombing field. Such a field will supply a long-felt need, since it will afford a good place for landing of planes experiencing trouble while engaged in bombing from low altitudes on the bombing field.

There is an emergency landing field at Edgewood Arsenal, but this is beyond gliding distance of the bombing field from an altitude of 2000 ft., at which considerable bombing is being done.

Chicago Airports

The recent balmy summer weather is bringing thousands to the flying fields of Chicago. Ashburn Field reports record crowds while Black's field is enjoying a better attendance than many of the best days in mid-summer. Automobiles lined up on the field and along Peterson Road and many sight seers crowd around the planes. A number of passengers were taken up for short rides.

Hart Smith recently left for Indiana, where he will do some exhibition flying and passenger carrying.

The Heath Airplane Co. has purchased a Curtiss motored Standard plane, which they will use in addition to the Heath "Favorite" for instruction and passenger work. As soon as the hangar is erected both planes will be permanently housed at the company's new field at Western avenue and Addison street.

Stanley Wallace, designer of the Heath "Favorite" has purchased a small Curtiss, Model "F" flying boat from the Triangle Airways, Inc. Wallace intends to fly the boat at the Wisconsin summer resorts during vacation season. The boat is now undergoing a rejuvenating process, but will be ready to be assembled next month. With the hull valsparred and the wings doped an excellent performance is hoped for.

Photographs of the Louisville Derby were carried for one of the Chicago daily newspapers from Louisville to Chicago by Nimmo Black and A. Anderson. The start from the field was made difficult by the fact that it had been flooded by a rainstorm, but the fliers successfully took off although clearing the tree tops at one end of the field with little margin.

The flight to Louisville was uneventful, the air being clear and the wind favorable. At the finish of the race Black hurried the photos to his plane and seven o'clock found him again in the air, homeward bound. By nine o'clock, somewhere in the neighborhood of LaFayette, Ind. darkness overtook the ship, and with railroads and highways obliterated the last hour of the flight was mostly guess work. When Black's engine was heard in the distnace bon-fires were lit at the four corners of the field and with these to guide him, Black made a perfect landing, three hours after leaving Louisville.

Anxious newspaper men crowded around the plane, grabbed the photos and rushed it to the city in time for the morning edition.

Hart Smith has left Black's field in company with a friend for Iron Mountain, Mich. Like Black the day before, Smith had some trouble getting the big plane, loaded with gas, cameras and other equipment, to leave the muddy field. The extra power of his Hisso engine enabled him, however, to clear the field, and the plane was soon lost from sight in a big rain cloud.

Mexican Air Mail Experiments

The Mexican Air Force will shortly inaugurate an air mail service from Guadalajara and Tepic. An experimental flight with this end in view was made last April by four Farman planes of the Mexican Air Force from Mexico City to Guadalajara, piloted by the military pilots Santana, Altamirano, Alcala and Garcia. The ships which were apparently of the F50 type, fitted with two 375 hp. Lorraine-Dietrich engines, each carried beside the pilot two passengers and about 100 lb. of mail.

Only one of the ships reached Guadalajara, making a non-stop flight of 6 hr. 20 min. in high velocity winds which greatly reduced its speed and which forced another ship to land for lack of fuel. The other two ships were forced down enroute by engine trouble. The airway from Mexico City to Guadalajara is approximately 300 miles long and leads over high plateaus and lofty mountain ranges where treacherous air currents are frequently encountered.

Proposed Italian Air Lines

The Italian air department proposes to subsidize commercial flying boat services on the following routes: Turin-Trieste, Ancona-Zara, Civitavecchia-Golfo Aranci, Brindisi-Constantinople, Naples-Genoa or Marseilles and Brindisi-Alexandria (Egypt). With this end in view the Italian air minister has requested Italian seaplane manufacturing firms to state which of these routes they desire to operate.

German Air not Free

As AVIATION reported at the time, Germany regained on Jan. 1, 1923, the sovereignty of its air space which was up to that date restricted by the Treaty of Versailles, although the so-called Nine Rules laid down by the Council of Ambassadors still restrict the performance of German civil aircraft to a "non-military maximum," while the Treaty of Versailles prohibits Germany from building and maintaining military aircraft. Outside of these restrictions Germany is free to govern her air space as she sees fit.

Germany is endeavoring to have the Nine Rules abrogated and in order to bring this about she has issued official notification that no French civil aircraft must cross her territory under penalty of seizure unless provided with a special authorization. This prohibition was chiefly aimed at the Paris-Prague-Warsaw air line, which twice crosses German territory. (Regarding the London-Berlin air line the German government came to a separate agreement with the British government.)

On May 19 last seized the opportunity she was looking for when a French air liner bound from Paris to Prague had a forced landing in Bavaria. The passengers were authorized to proceed to their destination by train, but the ship was seized and the pilot detained two days to satisfy the requirements of the German government. According to *L'Aéro-Sports* the Germans treated the pilot and passengers very courteously.

Incidentally it may be remarked that this was the first forced landing the French-Roumanian Air Line experienced in German territory during two months' operation, in the course of which Southern Germany was flown over more than 200 times, and Prussia—between Prague and Warsaw, about sixty times. The stretch of German territory on the Paris-Prague airway is about 400 miles long, and that on the Prague-Warsaw airway about 100 miles.

Proposed British Mail Plane

According to the *New York Times*, the British postal authorities are having specifications prepared for entirely new types of mail planes, including a new metal-built craft which is to embody in its construction every new idea of worth which nearly four years of commercial flying can suggest.

In its great mail chamber, illuminated with electric lights for night transport, expert sorters will be able to carry on their work just as they might in a mail train. So long will it be able to remain in the air without alighting that the members of the crew in charge of it are to be provided with regular sleeping quarters on board. They will, in fact, work in shifts while in the air, some of them sleeping while others are on duty in the control chamber guiding the airplane.

It is stated that this giant plane will be able to keep in the air for nearly twenty-four hours without alighting and accomplish a non-stop flight of about 2,000 miles.

Trans-Mediterranean Airways

An experimental flight from Marseilles to Algiers was made on May 16 by Pierre Latécoère, director of the Latécoère Air Lines, preparatory to the inauguration of a public service of this airway. The flight was made in a Bréguet land plane from Marseilles to Barcelona, whence a Lioré & Olivier twin-engined flying boat was used for crossing the Mediterranean by way of Palma, in the Balearic Isles. The elapsed time of the flight from Marseilles to Algiers was 10½ hr., and the total distance covered 560 miles, 300 miles of which were over water.

When this service will be opened to the public, the trip from Marseilles to Algiers will take 7½ hr. which in combination with night train services between Marseilles and Paris will place the French capital within 20 hr. travel from Algiers, as against two days by train and steamer.

Lions Travel by Air

A French commercial plane which recently arrived in Paris from Brussels carried as passengers three young lions. The animals were bought by a tamer in Rotterdam. They started their journey to Paris by rail, but the Belgian railroad strike brought an indefinite delay at Brussels and, after waiting two weeks, the tamer appealed in despair to the air mail line, which gave the lions a berth in the Goliath Nivelle.

Who Owns the Air ?

In the January *Docket* a short item under this heading contained the information about how two young officers had been fined $1 each for flying over the farm of Mr. Grube, of Punxsutawney, Pa.

This case was appealed, and came before Judge Corbett, of the Fifty-Fourth Judicial District. The testimony showed that Grube was the owner of an unoccupied farm in a good state of cultivation and with suitable buildings thereon, and that he had caused to be prominently posted on various places on the farm the notice prescribed by the Act of April 14, 1905, P.L. 169.

Nevin, one of the defendants, was an experienced aviator, and was engaged in the business of carrying persons, for a consideration, in short flights in an airplane. In this business he used as a starting and landing place the farm adjacent to the Grube farm. On the day in question, Nevin operated the airplane and with a passenger aboard, rose in flight into the air from the starting point, flew over the Grube farm and after a short flight returned to the starting point, without again flying over Grube's land.

The airplane, when it first came over the Grube farm, was about 50 ft. in the air and the height was increased to about 350 ft. by the time it left the Grube farm. The airplane was in the air all of the time of its flight and at no time touched the ground.

The court, after reviewing the advance of aeronautics in 1905, at the time this law was passed, comes to the conclusion that it was the intent of the Legislature to make subject to a penalty such things as were at that time, and always have been, trespasses upon the land. The court says:

"Before incurring the penalty of the act, it is essential that the alleged trespasser shall first have been warned by notices 'posted upon' the 'land' where they might be seen. But it seems incredible the Legislature would expect 'printed notices' posted upon the land to be seen by an aviator in rapid flight over a piece of land or that he could or would descend, alight, ascertain property lines, and then look for notices in order to determine—if not already a trespasser and arrested as such—whether he was at liberty to proceed or could go no further—than to jail, perhaps.

"Clearly it cannot be said that the flight of an airplane over land was, at the time of the passage of the act, such a thing as was, and always had been, a trespass upon land. 'Wilfully to enter upon land,' as used in the act, indicates encroachment on or interference with the owner's occupation of his soil, but it is not synonymous with a flight through the air over it, which has yet, so far as we are aware, to be held an entry upon it, and a meaning of the term not heretofore attributed to it.

"The court is of opinion the Act of April 14, 1905, P.L. 169, is inapplicable and does not warrant the present prosecution."

Commonwealth vs. Nevin, 2 District and County Reports, 241. (Comment and extract from *The Docket*, April 1923.)

How an Inclinometer Operates

That some pilots are blissfully ignorant of how an Inclinometer works, will be evident from the following inquiry the Pioneer Instrument Co. received some time ago. The letter reads:

"Sometime ago I was called on to decide a discussion in regard to the reading of a horizontal spirit level type inclinometer used on the Navy N9 seaplane, which is a curved glass tube, I presume made by your firm. I am therefore taking the privilege of asking you to make the decision.

"It is understood the zero reading of the instrument when the wings are horizontal laterally is correct. (The bubble in the center). A said, if in flight the plane was banked to a proper angle so as not to skid or slip on a turn the bubble would remain at zero, and only in the case of a skid or slip would the reading be other than zero. B said the bubble would go to the high side of the tube when making a turn regardless of skid or slip.

"This question is a very important one when instructing students on aircraft instrument operation. I am therefore asking your view on this question as I do not feel qualified to decide it myself."

The reply of the Pioneer Instrument Co. follows:

"Answering your letter of May 12, I am pleased to advise that your friend A is correct in his understanding of the operation of a bank indicator.

"A bank indicator or lateral inclinometer, whether of the ball or bubble type, indicates zero when the airplane is in the correct lateral position (neither slipping nor skidding) whether flying straight and level or turning and banked.

"The theory behind this is quite simple. An airplane neither slips nor skids so long as the force of gravity, or the combination (resultant) of gravity and centrifugal force remains perpendicular to the lateral axis of the airplane.

"A pendulum supported on a fore and aft axis will continuously indicate the direction of the resultant of gravity and centrifugal force, except for the effect of its inertia. A ball or bubble indicator operates as a simple pendulum whose inertia is so little it may be ignored. When such an instrument indicates zero, therefore, the resultant of gravity and centrifugal force is perpendicular to the lateral axis of the airplane and the proper lateral attitude is maintained."

Landing Fields at Lakehurst, N. J.

Two landing fields are available at the naval air station Lakehurst, N. J. Both fields are of a soft sandy nature, located southward of the dirigible hangar, one westward and the other eastward of the road, and both marked by white landing "Ts." The boundary corners are marked by red flags on short light staffs.

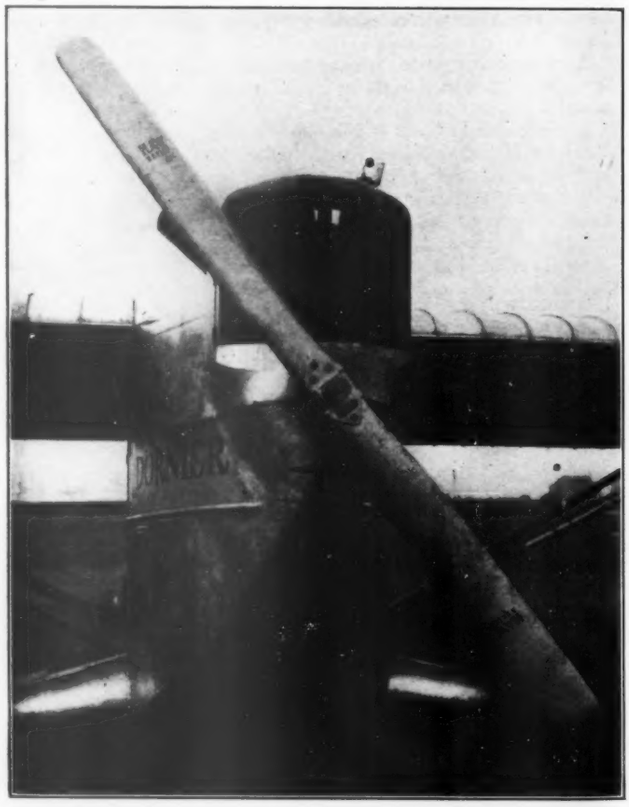
The east field is 1,000 ft. east and west by 400 ft. north and south.

The west field is 1,000 ft. east and west by 1,000 ft. north and south.

Approx. position: 40° 60′ N., 74° 20′ W.

(See Notice to Aviators 1 (1, page 14) of 1922.)

(N. A. 6, 1923.)



Kadel & Herbert

All metal variable pitch propeller made in Germany and mounted on a Dornier "Komet" transport plane fitted with a 185 hp. B.M.W. engine

U. S. ARMY AND NAVY AIR FORCES

U. S. ARMY AIR SERVICE

Stormy Flight of an Airship

The Army A.S. airship AC1, which left Scott Field, Ill., June 7 to get the crew of the TC1, which was destroyed by lightning at Wilbur Wright Field, Dayton, Ohio, June 6, returned to the aviation field June 8, having battled her way all night through a fierce storm in Indiana and Ohio.

The ship left Scott Field Thursday morning at 8.05 o'clock for Wilbur Wright Field with Lts. W. C. Farnum and George W. McIntyre as pilots and Sergt. Joseph Bishop as rigger and Sergeant Greenfield as engineer. They arrived at Wilbur Wright Field at 1.30 o'clock the same afternoon, but could not secure their ship to the mooring mast. There was high wind with an electrical storm in progress and the pilots feared that their ship might suffer the same fate as the TC1.

The crew of the AC1 had the choice of one of three courses, flying to Akron, Ohio, to the Goodyear Tire and Rubber Co. hangar, to Langley Field, Va., to avoid the storm, or to fight their way back to Scott Field through the storm. They finally decided on the latter course and started at 3.11 o'clock with only two of the crew of the TC1 on board, as they were not able to carry more through the storm.

According to the story related by members of the crew, the storm struck the AC1 nine miles out of Wilbur Wright Field and lasted two hours. The storm was followed by a thirty-mile wind which lasted through the entire night until 6 a. m.

Three times the rudder control of the ship broke during the night, leaving the ship at the mercy of the storm which blew them sixty miles out of their course. The pilots of the ship were unable to check their course on account of the inky blackness of the night, but got their bearings at the first signs of daylight. They found themselves over Bloomfield, Ind., just ten miles south of their course, at 4.15 o'clock and until 6 o'clock the ship flew at an average air speed of 55 m.p.h. On account of the high wind they were unable to cover more than 14 m.p.h., ground speed.

At 6 a. m. the wind shifted around to the north, giving the ship easier flying. After that they covered 40 m.p.h. until the ship landed at Scott Field.

The members of the crew stated that although they had to fight a bad storm all night, their trip had been one of extreme comfort on account of the closed car with which the AC1 is equipped. The car has sleeping compartments and a complete kitchenette, providing every luxury that can be had in a Pullman car.

The crew of the AC1 that returned consists of Lts. W. C. Farnum, George W. McIntyre, pilots; W. J. Flood and C. M. Brown, student officers; Mtr. Sergt. Joseph Bishop, rigger; Sergeant Greenfield, engineer.

C. R. Maranville, an employee of the Goodrich Tire and Rubber Co. of Akron, Ohio, who was with the crew of the TC1 at the time it was struck, suffered the amputation of his foot at the hospital in Dayton. He and Sergt. Harry Barnes of Scott Field leaped to the ground, a distance of forty feet, and received injuries, Maranville a crushed ankle and Sergeant Barnes a sprained knee.

New SE5's at Mitchel Feld

Three SE5 ships, equipped with 180 hp. Wright motors have been received at Mitchell Field, L. I., N. Y., and are now in course of being set up. These planes have aroused considerable enthusiasm among the pilots who lately have been flying DH's almost exclusively. It is believed that these fast, light maneuverable planes will be a valuable addition to the training equipment.

Mitchel Field Recruiting Campaign

With the utmost conservation of funds and personnel, Mitchel Field has accomplished the task of recruiting to full Air Service enlisted strength through the medium of advertising. Frequent mention of the post in the daily and weekly papers served to stimulate a healthy interest in the activities at the field, with the result that enough men apply throughout the Corps Area and at the station to fill all vacancies.

It is a noteworthy fact that the class of men being received are of a particularly good type. As a rule they come from the smaller towns and cities in New York and New Jersey, and they have been attracted to the Air Service through the opportunity offered to continue work on some subject in which they are interested, usually photography, radio or allied Air Service activities. Strict faith is kept with each man. He is given the work for which he is best fitted and the opportunity, through the Post School, to fit himself for something still better.

Lt. C. L. Bissell Honored

Secretary of War Weeks on June 6 personally presented a Distinguished Service Cross to First Lieut. Clayton L. Bissell, A.S., aide to Brig. Gen. William Mitchell. The award is accompanied by the following citation:

"Clayton L. Bissell, first lieutenant, Air Service, then first lieutenant 148th Aero Squadron, Air Service. For extraordinary heroism in action on Oct. 28, 1918, in the vicinity of Jenlain, France. While a member of a flight he was attacked by greatly superior numbers of enemy planes. Lieutenant Bissell observing an American plane attacked by eight of the enemy, dived into their midst, destroying one plane, whereupon he was set upon by three enemy Fokkers, one of which he shot down, driving the remaining planes to their own lines. His own plane was so badly crippled as to be beyond repair. The outstanding bravery displayed by Lieutenant Bissell greatly inspired the members of his Squadron."

Primary Flying School

The class attending the Primary Flying School at Brooks Field, San Antonio, Tex., finished their work on Saturday, May 19, and the cadets moved to Kelly Field the following Monday to commence their advanced flying instruction. The student officers reported at Kelly Field the next day and were assigned to their quarters. All air work at Brooks Field is now reduced to a minimum, and every effort is now being made to get the airplanes and the post in condition for the class which will enter in September. At present as many men as possible are assigned to utilities to finish up the various construction projects to be done, and steps are being taken to open the Aero Repair shop for active work.

Kelly Field Entertains General Patrick

The Officers of the San Antonio Air Intermediate Depot were hosts at a very enjoyable luncheon recently in honor of Maj. Gen. Mason M. Patrick, Chief of Air Service, on the occasion of his inspection of the various activities at Kelly Field. Among the guests present were the Commanding General of the 8th Corps Area, the Air Officer, 8th Corps Area, Commanding Officer, Executive Officer, Commanding Officer of the Attack Group and Commanding Officer of the 10th Group from Kelly Field, and the Commanding Officer of Brooks Field.

Change in Station

The 42d Air Intelligence Section has been transferred from Manila, P. I., to Camp Nichols, P. I.

Dayton Celebrates Aviation Day

Dayton celebrated Aviation Day on May 28 in honor of the return to Dayton of Lts. J. A. Macready and O. G. Kelly from their transcontinental non-stop flight from New York to California, the mayor declaring a half-holiday and school children being released to witness the aerial circus held at McCook Field at 2 o'clock in the afternoon.

The opening event was a DeHaviland 5-ship formation, flown by Lieutenants Ballard, Barton, Stromme, Mallory, and McPike. These left the ground together and climbed to altitude, where the effect of this type of flying is most picturesque. Scarcely had the DeHavilands left the ground, when three Vought planes piloted by Lieutenants Brookley, Pearson, and Mills took off in a speed race, in five laps about the Field, each lap covering a distance of about two miles. Lieutenant Pearson won the race, flying at a rate of 120.2 m.p.h.

Immediately after the race, the three Voughts took off again for acrobatic formations. Almost wing to wing they flew and looped, which performance, well-rehearsed and beautifully given, was the high spot in the afternoon's exhibition.

Later the three ships gave up the center of the stage, and continued their stunting at altitude, while a Martin Bomber swept across the Field, dropping four parachutes with dummy passengers from the wings. The Martin continued to fly, while a small Fokker monoplane, piloted by Lieutenant Doolittle, maneuvered about it, under and on top of it, looping and diving, presenting a keen contrast in size, speed, and dexterity to the doughty Martin. Combat work by several additional planes was then indulged in at altitude, while the lower picture was cut by the new Curtiss pursuit plane, flown by Lieutenant Wade. The latter flew the length of the Field several times, demonstrating the slow and high speeds of the plane, put it through stunts of every description, finally joining in the grand finale, consisting of combined stunting of all the airplanes, from ground to 4500 ft. altitude.

Lieutenant Brookley, Chief of Flight Test Branch at McCook Field, had full charge of the arrangements of the aerial circus, and was one of the prominent flyers. The following pilots participated: Captain Tillinghast, Lieutenants Pearson, Brookley, Van Veghten, Boyd, Mills, Doolittle, Fairchild, Ridenour, Carroll, Bruner, Hegenberger, Johnson, Redman, Koontz, Ballard, Barton, Stromme, Mallory McPike, and Civilian pilots Lockwood and Meister.

When the exhibition was planned, it was thought Lieutenants Kelly and Macready would have arrived and be witnesses of honor. On the morning of the 28th, when word came that they would leave Kansas City at 8:30 a. m., although it was too late to postpone the aerial circus, it was hoped that the two flyers would put in an appearance before the close of the performance. Before the circus started however, it was known that they had been delayed in leaving and that there was no chance of their arriving before late evening or night.

The biggest feature of Aviation Day, however, was the dinner of 1200 covers given by the American Legion at Memorial Hall, Dayton. The speakers' table was set on the stage, and when shortly after seven those who were to occupy it, Commanding Officers of McCook and Wilbur Wright Fields, F. B. Hale, Mayor of Dayton, Congressman Fitzgerald, Senator Fess, G. B. Hirsh, Commander of American Legion, Dayton Post, and other distinguished citizens filed in, the two vacant chairs next to Orville Wright, told the story that the guests of honor had failed to arrive. This was no great shock to the initiated who knew that, barring accident, the two flyers would land in Dayton about 8 o'clock, and as the knowledge spread, a decided ripple of expectancy ran through the hall. At 8:15, Major McIntosh got word that the T2 had just landed.

The dinner was a complete surprise to the flyers and it was nine o'clock before they, remarkably spick and span after their day's flight, faced an audience whose cheers a'most drowned out the band, which thundered the jovial, "Hail, Hail, The Gang's All Here!" It was some ten minutes before the demonstration could be quieted and Mr. Hirsh cou'd introduce Charles F. Kettering, Vice President of General Motors Corp., who was to act as Toastmaster. Mr. Kettering in turn presented Mayor Hale, who in the name of the City of Dayton welcomed the flyers home.

Major McIntosh responded in his usually happy vein, enlarging upon the development of aviation as demonstrated in the making of recent world records leading up to the pronouncement that in the face of the almost impossible recent accomplishments, the wise modern did not say that anything could not be done. Frederick B. Patterson, President of the National Cash Register Co., introduced Lieutenants Kelly and Macready, but the important feature of his speech was the word just received by him as chairman of the Dayton Aviation Committee, from Washington, that the new site purchased by the people of Dayton for $400,000 had been finally accepted by the Government for the new home of the Engineering Division. Lieutenant Kelly then gave a detailed account of the flight of the T2 from coast to coast. Congressman Fitzgerald then made a plea for the appreciation of genius in America. "We have the genius and the money for development in America," he said, "but we have all too often lacked the vision and foresight of foreign countries, with the result that the United States in instances too numerous to mention is paying foreign governments for the use of patents for inventions originated by American genius, which might have had American development had we not been so totally lacking in vision." He also expressed the opinion that such officers as Kelly and Macready who had rendered such distinguished services, should be granted promotions, not because they "needed or wanted them, but because they deserved them," and that Congress should set aside an appropriation for that purpose.

Major Hauser then presented Lieutenant Macready with a silver pitcher and tray, a wedding gift of the Mens' Club of the Y. M. C. A., of which Lieutenant Macready is a member. For, as is well-known Lieutenant Macready successfully completed a courtship as well as a transcontinental non-stop flight when he reached California, and a Mrs. Macready is shortly expected in Dayton.

El Paso Celebration

During the week of May 19 the 12th Squadron, stationed at Fort Bliss, Tex., participated in the Golden Jubilee celebration held in the city of El Paso in commemoration of the fiftieth anniversary of its incorporation as a city. A four-plane formation was flown Wednesday over the city for an hour during the parade of the First Calvary Division, at which time many oblique photographs were made of the parade. On the following day another formation of four planes flew over the inspection and review of the First Cavalry Division held as part of the jubilee. On Friday the Cavalry Division staged a demonstration of night raiding on a large scale, all arms, including Artillery, tanks, Cavalry, Infantry, machine guns, and Air Service participating. Two planes from the 12th Squadron took off at 8:00 p. m. and flew over the battle for an hour, after which each plane dropped four Mark I airplane flares over the village which had been constructed by the Engineers and which was the objective of the raid. The flares lighted the scene brilliantly for miles around, giving a very spectacular effect. Thousands of people witnessed this exercise in which live ammunition was used. Lieutenants O'Connell and Sullivan piloted the two planes and demonstrated their skill as night fliers.

Death of Lieut. Wendell K. Phillips

First Lieut. Wendell K. Phillips, A.S., died June 5, 1923, as a result of injuries received in an airplane accident at Aberdeen Proving Grounds, Md.

Lieutenant Phillips was born in New Jersey, April 30, 1899, and was appointed from New York. He enlisted in the Signal Corps as a private, Feb. 9, 1918; was appointed a Second Lieutenant, A.S., Oct. 6, 1918, and First Lieutenant, July 1, 1920.

He was assigned to active duty at Chanute Field, Oct. 6, 1918; left Oct. 16, 1918; arrived at Brooks Field, Oct. 17; left. Nov. 22, 1918; at Hazelhurst Field, Nov., 1918 to April 1 ,1919; at Aberdeen, Md., from April 3, 1919 to April 19, 1920; at recruiting station, Baltimore, Md., April 19 to June 15, 1920; on recruiting duty at Baltimore Aug. 13, 1920, to March, 1921; on duty with 49th Bomb. Squadron at Aberdeen Proving Ground, March 7, 1921, to date of death.

U. S. NAVAL AVIATION

More Aircraft Carriers

Following his inspection of the U.S.S. Langley, the only airplane carrier in the U. S. Navy, President Harding, is said to have expressed marked interest and enthusiasm over this converted vessel. The President, it was explained, is much interested in every phase of development in aviation,

Official Photo U. S. Navy

President Harding examines the aircraft arresting gear on the aircraft carrier Langley.

and is always anxious to keep posted personally. The recent trip of the Langley to the Washington Navy Yard was the first opportunity he had had to visit this unique mothership for airplanes of the Fleet.

Work on the plans for converting the two uncompleted battle cruisers Lexington and Saratoga is expected to be pushed, governmental officials now believe, and it is said on good authority that appropriations for new and modern craft of this type will be asked of Congress in the fall. At present this government has only the Langley, whereas England has six such vessels; one first-line craft and three second-line ships completed, and two second-line ships building.

The Bureau of Aeronautics is planning to place two airplanes on the new Cruiser Milwaukee on her "shake-down" cruise from Puget Sound to Hawaii, New Zeland, Samoa and Australia. They are now trying to arrange a trip for the Langley along the New England Coast this summer for exhibition purposes.

Water Recovery from Airship Engines

In connection with the development of rigid airship construction for the Navy at the Naval Air Station in Lakehurst, New Jersey, and the building of the ZR1, some interesting and valuable experiments have been conducted in weight compensation by extracting water vapor from the engine exhaust of the motors that will drive the ship.

On long distance cruising in airships the problem of taking on weight to compensate for the fuel burned while underway has always presented a problem that has never had a satisfactory solution. Experiments at the Naval Air Station in Lakehurst recently have given every assurance that this problem can be satisfactorily met by extracting the water vapor from the engine exhaust. This development will add much to the efficiency of airship operation in that it will eliminate to a great extent the valving of gas from the gas cells to compensate for the loss of weight in fuel. Theoretically it has been proven that for every pound of fuel burned, a pound and three quarters of water can be recovered from the exhaust. In practice, however, this theoretical mark could not be attained, and it is estimated that about 95 per cent of the weight of fuel could be obtained in water recovery. If the experiments already conducted bear out the promise of success that they indicate, airships will carry ballast in the form of caustic soda. The absorbing qualities of caustic soda recommend it for this use. It can be caused to extract water from the exhaust in almost the exact weight of gasoline consumed by the engines. This will effect a great economy in loss of gas.

The use of helium in naval airships gives particular importance to the development of ballasting by water recovery. Any measure that will lead to the conservation of helium is of great practical value from the standpoint of economy.

Miscellaneous Notes

A honeymoon by airplane excited considerable interest in Pensacola recently when one of the Machinist Mates attached to the Naval Air Station flew away with his bride on a tour of the southern coast. The groom was P. Q. Gunn, Aviation Machinist Mate, 1st Class, who is attached to Squadron No. 3 at the Air Station. Recently Gunn purchased an MF flying boat with his savings and one of the pilots at the Air Station gave him flying instruction until he was thoroughly proficient in the operation of the airplane. Gunn then gave lessons in flying to his fiancee and they laid their plans to make their honeymoon journey by air. The wedding took place June 8, and the bride and groom took off in the plane for a cruise which included Mobile, Ala., Biloxi, Miss., Gulfport, Miss., and New Orleans, La. Mrs. Gunn piloted the plane from Pensacola.

Captain E. S. Land, Com. J. C. Hunsaker, and Lieut. Comdr. Kraus sailed last week for Germany where they will confer with authorities of the Zeppelin Company in Friedrichshafen on the progress and plans of the ZR3, the rigid airship which is under construction for the U. S. Government.

The UO1 has had builder's trials as a land plane at Mitchell Field, and is being shipped to Philadelphia for official trials as a seaplane. If proven successful the first three planes of this type will be placed on board the new cruiser Richmond for use on the catapults.

COMING AERONAUTICAL EVENTS

DOMESTIC

July 4 — National Balloon Race, Indianapolis, Ind.
Oct. 1-3 — National Airplane Races, St. Louis, Mo.
Late Fall — Curtiss Marine Flying Trophy Race

FOREIGN

July 20-Aug. 12 — International Aero Exhibition, Gothenburg, Sweden
Aug. 3-31 — Sailplane Meet, Rhoen, Germany
Aug. 5-26 — Sailplane Meet, Vauville, near Cherbourg, France
Sept. 23 — Gordon Bennett Balloon Race, Brussels, Belgium
Sept. 28 — Schneider Maritime Aviation Trophy Race, Cowes, Isle of Wight, England
Dec. 1 — Entries close for French Engine competition

Naval Orders

Lt. John D. Alvis, USN—Detached Aircraft Squadrons Battle Fleet; to Naval Air Station, Pensacola, Fla.

Lt. Sherrod H. Quarles, USN—Detached Bu. Aeronautics; resignation accepted 7-27-23.

Lt. Frank C. Fake, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, San Diego, Calif.

Lt. Volney C. Finch, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, Pensacola, Fla.

Lt. Thomas L. Sprague, USN—Detached Aircraft Squadrons Battle Fleet; to Naval Air Station, Pensacola, Fla.

Lt. Frank R. Whitmore, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, San Diego, Calif.

Ens. Myron F. Eddy, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, Pensacola, Fla.

Ens. William S. Grooch, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, Pensacola, Fla.

Ens. George H. Hasselman, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, Pensacola, Fla.

Ens. George L. Richard, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, Pensacola, Fla.

Ens. Meinrad A. Schur, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, Pensacola, Fla.

Lt. Arthur C. Davis, USN—Detached USS Idaho 6-10-23; to Naval Air Station, Pensacola, Fla.

Lt. John G. Farrell, USN—Detached Naval Air Station, Pearl Harbor, T. H.; to Aircraft Squadrons, Battle Fleet.

Lt. Samuel P. Ginder, USN—Detached Naval Air Station, Pensacola, Fla.; to Aircraft Squadrons, Scouting Fleet.

Lt. Victor F. Marinelli, USN—Detached Naval Air Station, Pensacola, Fla.; to Aircraft Squadrons, Scouting Fleet.

Lt. Allen I. Price, USN—Detached Naval Aircraft Factory, Philadelpha, Pa.; to Aircraft Squadrons, Scouting Fleet.

Lt. Harold B. Sallada, USN—Detached Naval Air Station, Pensacola, Fla.; to Aircraft Squadrons, Scouting Fleet.

Lt. (jg) Joseph H. Gowan, USN—Detached Aircraft Squadrons Battle Fleet; to Naval Air Station, Lakehurst, N. J.

Ens. Dolph C. Allen, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, Anacostia, D. C.

Ens. William B. Gwin, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Air Station, Hampton Roads, Va.

Ens. Lucian A. Moebus, USN—Detached USS Bruce; to Naval Air Station, Pensacola, Fla.

Ens. Frederick H. Ottaway, USN—Detached Naval Air Station, Pearl Harbor, T. H.; to Aircraft Squadrons, Battle Fleet.

Ens. Carlton D. Palmer, USN—Detached USS Langley; to Naval Air Station, Anacostia, D. C.

Bosn. Earl E. Reber, USN—Detached Aircraft Squadrons, Battle Fleet; to Naval Aircraft Factory, Philadelphia, Pa.

Gun. John E. Reuschel, USN—Detached Naval Air Station, Anacostia, D. C.; to Naval Aircraft Factory, Philadelphia, Pa.

Lt. Comdr. Henry B. Cecil, USN—Orders 5-16-23 revoked, continue duty Bureau of Aronautics, Washington, D. C.

Ens. George H. DeBaun, USN—Detached USS Idaho; to Naval Air Station, Pensacola, Fla.

Lt. Arthur Gavin, USN—Detached Naval Air Station, San Diego, Calif.; to Aircraft Squadrons, Scouting Fleet.

Lt. Donald B. Duncan, USN—Detached Naval Air Station, Pensacola, Fla.; to Aircraft Squadrons, Battle Fleet.

Lt. Albert E. Dupuy, USN—Detached Naval Air Station, Pensacola, Fla.; to Aircraft Squadrons, Battle Fleet.

Lt. Carl A. Scott, USN—Detached Naval Air Station, Pensacola, Fla.; to Aircraft Squadrons, Battle Fleet.

Lt. (jg) Van Rensselaer Moore, USN—Detached USS Wright; to USS Isherwood.

Bosn. Albert E. Baker, USN—Detached Naval Air Station, Pensacola, Fla.; to Aircraft Squadrons, Battle Fleet.

Gun. William Wilkinson, USN—Detached Naval Air Station, Pensacola, Fla.; to Aircraft Squadrons Battle Fleet.

Mach. Zemp W. Cornwell, USN—Detached Naval Air Station, Pensacola, Fla.; to Aircraft Squadrons Scouting Fleet.

Mach. Walter R. Jones, USN—Detached Naval Aircraft Factory, Philadelphia, Pa.; to USS Wright.

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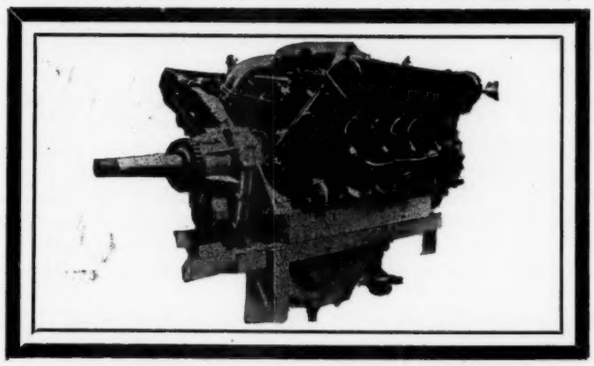

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INDEX TO ADVERTISERS

A

Aerial Sales Service, Inc. 28
Aircraft Service Directory 31
American Propeller & Mfg. Co. 31

B

Boeing Airplane Co. 27

C

Classified Adv. 28
Curtiss Aeroplane & Motor Corp. 2

E

Erieson Aircraft, Ltd. 31
Elias, G., & Bro. 31

H

Huff Daland Aero Corp. 31

L

Levy, James, Aircraft Co. 31
Ludington Exhibition Co. 28

M

Martin, The Glenn L., Co. 32

N

Northrop, Marvin A. 28

P

Pioneer Instrument Co. 31

R

Roebling's, John A., Sons, Co. 28

S

Samuel, DeNeal H., Inc. 25
Sperry, Lawrence, Aircraft Co., Inc. 31

T

Thomas-Morse Aircraft Corp. 3
Titanine, Inc. 31

W

Warner, Edward P. 31
Where to Fly 24
Wright Aeronautical Corp. 4

Y

Yackey Aircraft Co. 31

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